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# The Communicator

September—October 2022



# SARC

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 **separ** Mobile Cruise-In



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**Our article reprint policy is on page 125**

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During non-publication months we encourage you to visit the Digital Communicator at [ve7sar.blogspot.ca](http://ve7sar.blogspot.ca), which includes recent news, past issues of *The Communicator*, our history, photos, videos and other information.

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SARC maintains a website at [www.ve7sar.net](http://www.ve7sar.net)

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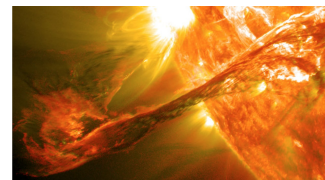
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## IN THIS ISSUE



*Rebuilding the MFJ-557 CW practice oscillator*

*Peter Vogel writes about  
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*This issue, Kevin VE7ZD writes about  
'Drones to Augment Amateur Radio'*

*...and so much more!*





# QRM

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...from the Editor's Shack

*Do you have a photo or bit of Ham news to share? An Interesting link?*

*Something to sell or something you are looking for?*

*eMail it to [communicator at ve7sar.net](mailto:communicator@ve7sar.net) for inclusion in this publication.*

Here at Surrey Amateur Radio Communications (SARC) we consider September to be the start of our new operating year so, Happy New Year!

This promises to be another great year for our two allied organizations, as both SARC and Surrey Emergency Program Amateur Radio (SEPAR) are moving ahead with a busy schedule. We just completed a major event for SEPAR, the first Mobile Cruise-In. Detailed in a story starting on page 36. Just ahead for us is the first significant run/walk in our community, certainly since COVID put the brakes on public events. [RunSurreyRun!](#) is a 5 and 10 kilometre family event that has a route through central Surrey. We expect to have about twenty hams

along the route and at the start/finish where we will be locating

the SEPAR trailer as our communications hub.

Events like this are important for amateur radio and our emergency program. After impressing the judges at Cruise-In with our capability and portability, we now have the opportunity to demonstrate how that capability can be put to use in a community event, as it would in time of real need.

It also provides some realistic training for our members, and for those new to the hobby. We encourage our course graduates to team up with an experienced ham to see what communications is all about, what works and what does not.

Enjoy the last few weeks of summer.

73,

~ John VE7TI, Editor  
[communicator@ve7sar.net](mailto:communicator@ve7sar.net)

### ***This Month's Cover...***

*A major new event for our two organizations. The SEPAR sponsored Mobile Cruise-In was an eye-opener for our served agencies and an opportunity for socialization and demonstration for the participants. There is a full story starting on page 36.*



"Two things are infinite: the universe and human stupidity; and I'm not sure about the universe."

— Albert Einstein

### **On the Web**

[ve7sar.net](http://ve7sar.net)

Between Communicators, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web and social media:

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**Our YouTube Channel**

[SurreyARC](https://www.youtube.com/SurreyARC)

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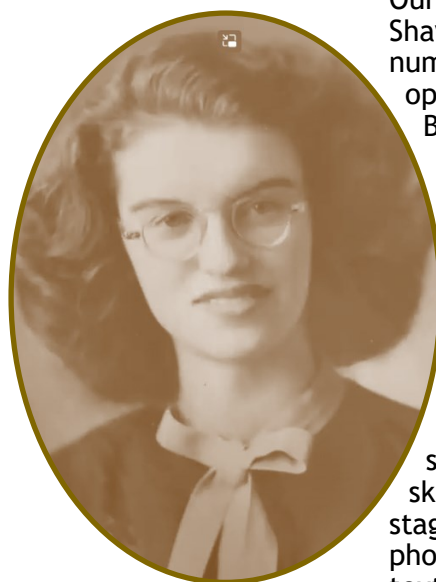
or

[tinyurl.com/SARCphoto](http://tinyurl.com/SARCphoto)



## The Rest Of The Story...

### *Lightning-fast telegraphist*



*Lavina Shaw*

Our profile this issue is of Lavina Shaw. She's one of a dwindling number of former Telegraph operators in Canada, also known as Brass Pounders

On a warm August afternoon at Calgary's Heritage Park, a crowd attending the annual Railway Days exhibition made their way to the pavilion to watch a live demonstration of telegraphy. Lavina and Earl Shaw, veteran telegraphers both in their 80s at the time, sat on stage, ready to show off their skills. On the other side of the stage stood two college students, phones in hand, eager to try their texting prowess against a master of the original instant message: Morse code. The emcee handed Lavina and her first competitor a piece of paper with a sentence to transmit, and they turned to their devices and started swiftly tapping away.

The transmitted message was read aloud within seconds, and the emcee declared Lavina victorious. Then it happened again. And again. Eventually the young texters admitted defeat and left the stage. The watching crowd erupted into enthusiastic cheers as the octogenarians were crowned instant messaging champions.

Long before mobile phones, there was the electrical telegraph. Although a number of working prototypes were developed in the early 19th century, it was the single-wire telegraph system invented by American Samuel Morse — and its eponymous alphabet of dots and dashes — that quickly became the international standard, including in Canada. In 1917, train dispatcher Vincent Coleman saved 300 lives by sending a heartbreaking warning to an inbound train moments before the Halifax Explosion. Two decades later, Canadians used Morse code to intercept German messages during the Second World War.

2021 marked a historic milestone: the 175th anniversary of Canada's first telegraph message. On Dec. 19, 1846, the Niagara Electro-Magnetic Telegraph Company sent a message from Hamilton to Toronto, which simply read: Who is in the office? The telegraph was the first technology to connect Canadians across the country, but the true pioneers are the people behind the wires. They call themselves "brass pounders," and Lavina Shaw is proud to be one of them.

Lavina was destined to be a telegrapher. Her father, grandfather and uncles all worked as railway



operators and used the telegraph to deliver train orders to conductors and engineers. As a young child, Lavina would lie in bed listening to the repetitive clicking and clacking of the register. It was a language she couldn't understand, and yet it was as familiar as the scraping of wheels on steel tracks and the stream of disembodied voices drifting from the train platform into her childhood home, the railway station in Sifton, Man. When she turned 10, Lavina asked her father to teach her the code.

"I was always going to be a teacher," says Lavina. "I just kept on learning telegraphy and when I got to be 17, I decided that I didn't want to live in a small village anymore. So, I went into Winnipeg and tried out as a telegraph operator. I passed right away."

Lavina decided to become a commercial telegrapher – a career which, surprisingly for the time, earned her the same wage as her male colleagues. Two months after completing her training, she was sent to Saskatoon for her first assignment with Canadian National Telegraph, working six days a week translating messages mainly sent from railway stations across the province. Much like modern-day texting, telegraphers used a series of abbreviations to speed up their communications. The

word that for instance, was shortened to tt: two dashes in Morse code. Recently, the now-92-year-old Lavina overheard a few people bemoaning the fact that teenagers are butchering the English language: "I got up and said, '50 years ago I used all those abbreviations, and I don't think the language was ruined!'"

During a typical shift, Lavina copied an average of 20 telegrams an hour, ranging from birthday messages to horse betting results. "That was a scandal, actually," she says. "They [the telegraph operators] would already have the results before they put [their own] bets in. They actually made quite a bit of money. I was told I don't dare tell anybody." Lavina was already sworn to secrecy: handling peoples' private communications meant everything she copied was confidential.

Life as a telegrapher was fast-paced and never boring. By 1946, sending and receiving

### Morse Code

Morse code has been in use for more than 160 years — longer than any other electrical coding system. What is called Morse code today is actually somewhat different from what was originally developed by Vail and Morse. The Modern International Morse code, or continental code, was created by [Friedrich Clemens Gerke](#) in 1848 and initially used for telegraphy between Hamburg and Cuxhaven in Germany. Gerke changed nearly half of the alphabet and all of the numerals, providing the foundation for the modern form of the code. After some minor changes, International Morse Code was standardized at the International Telegraphy Congress in 1865 in Paris and was later made the standard by the [International Telecommunication Union](#) (ITU). Morse's original code specification, largely limited to use in the United States and Canada, became known as [American Morse code](#) or "railroad code". American Morse code is now seldom used except in historical reenactments.

*A painting of the railway station in Sifton, Man., where Lavina Shaw grew up. (Image courtesy Lavina Shaw)*





*"They say women have a smoother method of sending."*

telegrams had become a regular part of daily life, but some people were still getting used to this "new" technology. "People thought that they could send flowers over the telegraph, and one person wanted to send a pair of shoes, thinking it would travel along the wire," Lavina laughs.

From Saskatoon, Lavina moved on to several smaller communities: Moose Jaw, Sask., Fort William, Ont., (now Thunder Bay) and Flin Flon, Man. As a female telegrapher, often working late into the night, she had several uncomfortable encounters. Lavina was paid the same as her male colleagues but wasn't always treated as an equal. I was sent to Thunder Bay and the boss there said he didn't want a woman working in his office. He didn't treat me very well; in fact, I would say he sexually harassed me. He said if I came down in the basement with him, he might consider me working there. When I had a day off, I went to the Union office, and they thought it was a big joke. Lavina left Thunder Bay a few months later, but that didn't stop her from pursuing her career.

One evening she received a telegram from a man claiming to be a judge's son, whom she presumes may have been running from the law. He threatened that if word got out, he was in the area, her life would be in danger. But her love for the job kept her going. When work was slow, she would play checkers with other operators over the wires, tapping out her every move. Soon, she could tell each telegrapher apart by their "fist," or distinct style

of transmitting. "I could still do that, hear somebody on there and know that's so-and-so," she says. "They say women have a smoother method of sending."

In Flin Flon, she covered local breaking news for the Winnipeg Free Press and even moonlighted as a sports broadcaster, doing play-by-plays at local hockey games.

In an example of online dating that long predates the internet, Lavina's "fist" caught the attention of Earl Shaw, a telegraph operator in Melville, Saskatchewan. By then, Lavina had returned to Saskatoon and copied lots of messages to and from Melville, nearly 300 kilometres away. A good majority were from Earl, who also grew up on a railway station and came from a family of telegraphers. Gradually, they started corresponding by regular mail to avoid any uninvited listeners along the line. He came into Saskatoon and decided to see this female telegrapher, which were very rare in the Telegraph business, and so he came in and he asked me to go to a baseball game. Three years later we got married.





The shared language that brought them together resurfaced after they were married in 1949. “When we had our two girls, we’d converse [in Morse code] with a fork and a knife... the kids couldn’t understand what we were saying,” Lavina recalls with a grin. Lavina’s daughters take after her. They are both in male dominated fields. One is an engineer, the other a pilot. Beyond passing down her legacy to family, Lavina is keeping telegraphy alive. She gives local presentations in Port Coquitlam about its history, and she hopes to preserve the first technology that connected Canadians across the country. It should be talking new history books and because it was it really changed the world and changed communication.

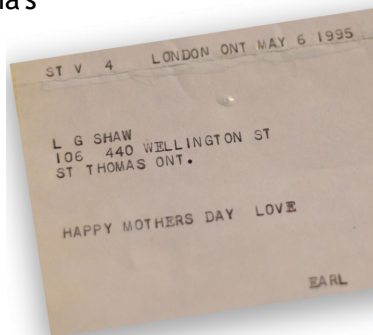
The couple settled in Vancouver, where Lavina landed a job with Canadian Pacific Telegraph, copying news for the Vancouver Sun and the Canadian Press. In 1952, she was put on a direct line to Time Magazine during the election of U.S. President Dwight Eisenhower. The little girl from Sifton, Man. who used to lie awake wondering what was being said over the wires was now translating major world events for millions of people across the country.

By the early 1960s, railway stations across Canada were shutting down and telegraphy was being replaced by telephones and computers. The last Morse code train order was sent in 1977. Lavina’s father, the man who bestowed his love for telegraphy, is long gone, along with Lavina’s childhood home. During the golden age of Canadian rail, “They had to have a telegraph operator every 35 miles [56 kilometres],” says Lavina. “It’s sad to travel through the prairies and not see any of the train stations there anymore.”

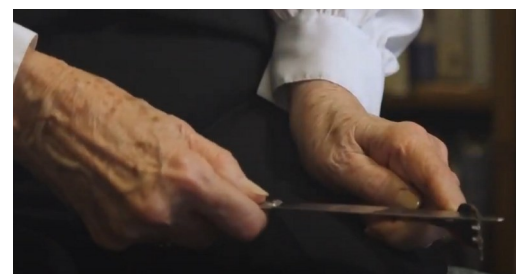
### ***Telegraphers, too, are disappearing.***

In June 2018, the B.C. chapter of the [Morse Telegraph Club](#) paid tribute to Lavina. The club is an international community dedicated to preserving telegraphy’s heritage. Lavina made history as its first and only female president despite a strong opposition to her candidacy. When she joined the B.C. chapter,

*Lavina Shaw in her telegrapher’s uniform, which belonged to her father. (Photo courtesy Lavina Shaw)*

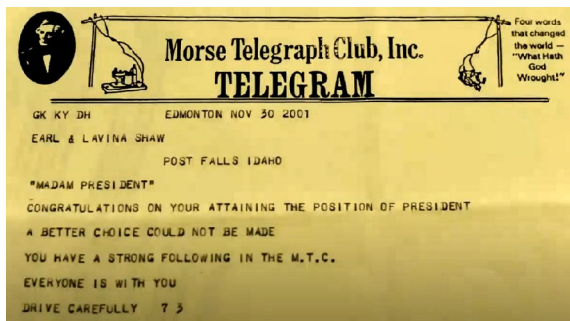


*Lavina and Earl Shaw married in 1949. A telegram sent by Earl to Lavina. (Images courtesy Lavina Shaw)*



*When we had our two girls, we’d converse [in Morse code] with a fork and a knife... the kids couldn’t understand what we were saying.*





Above: The telegram sent to Lavina upon her election as first female President of the Morse Telegraph Club.

Below: Lavina at our SARC meeting in September 2019



it had 75 members. After presenting her with her trophy, the 10 remaining members tapped a final goodbye. “Nobody else would volunteer so we had to close it down,” says Lavina. “There’s not too many of us left.”

As part of her own legacy, Lavina is determined to keep telegraphy alive and well. On yet another warm summer afternoon, before the COVID-19 pandemic, she stood in front of a group of curious campers in Port Coquitlam, B.C., where

she now lives, and taught each one how to tap out their name in Morse code. At our Surrey Amateur Radio Communications general monthly meeting in September 2019, Lavina gave a presentation about telegraphy and her career.

Technology may look very different today, but Lavina doesn’t want anyone to forget how telegraphy shaped modern-day communications.

“It should be taught in history books,” she says. “It really changed the world, and changed communication.”

And that, is her story.

~ With content from Kallan Lyons and Canadian Geographic

<https://canadiangeographic.ca/articles/behind-the-wires-a-look-back-at-canadas-golden-age-of-telegraphy/>

There is a video of Lavina’s story titled “Brass Pounder”. Watch it on YouTube: <https://youtu.be/mBZ60ZNLaq8>

## A spotlight on Telegraphy

We are accustomed today to sending and receiving messages with little delay. Electronic mail and instant messaging provide almost instantaneous ways to send information over great distances. For most of us, it is hard to imagine how we’d get along without this modern technology, which has its roots in the invention of the telegraph.

Telegraphy is not just dits and dahs. It also includes long-distance transmission of messages where the sender uses other symbolic codes, known to the recipient, rather than a physical exchange of an object bearing the message.



Thus flag semaphore is a method of telegraphy, whereas pigeon post is not. Ancient signalling systems, although sometimes quite extensive and sophisticated as in China, were



generally not capable of transmitting arbitrary text messages. Possible messages were fixed and predetermined and such systems are thus not true telegraphs.

The earliest true telegraph put into widespread use was the optical telegraph of Claude Chappe, invented in the late 18th century. The system was used extensively in France, and European nations occupied by France, during the Napoleonic era. The electric telegraph started to replace the optical telegraph in the mid-19th century. It was first taken up in Britain in the form of the Cooke and Wheatstone telegraph, initially used mostly as an aid to railway signalling. This was quickly followed by a different system developed in the United States by Samuel Morse. The electric telegraph was slower to develop in France due to the established optical telegraph system, but an electrical telegraph was put into use with a code compatible with the Chappe optical telegraph. The Morse system was adopted as the international standard in 1865, using a modified Morse code developed in Germany in 1848.

The heliograph is a telegraph system using reflected sunlight for signalling. It was mainly used in areas where the electrical telegraph had not been established and generally used the same code. The most extensive heliograph network established was in Arizona and New Mexico during the Apache Wars. The heliograph was standard military equipment as late as World War II. Wireless telegraphy developed in the early 20th century became important for maritime use, and was a competitor to electrical telegraphy using submarine telegraph cables in international communications.

The first telegraph message transmitted in Canada was sent from Toronto to Hamilton on December 19, 1846 by the Toronto-Hamilton-Niagara and St. Catharines Electro-Magnetic Telegraph Company. It was the birth of Canada's telecommunications industry, an industry that was crucial to the development of this vast country.

Telegrams became a popular means of sending messages once telegraph prices had fallen sufficiently. Traffic became high enough to spur the development of automated systems—teleprinters and punched tape transmission. These systems led to new telegraph codes, starting with the Baudot code. However, telegrams were never able to compete with the letter post on price, and competition from the telephone, which removed their speed advantage, drove the telegraph into decline from 1920 onwards. The few remaining telegraph applications were largely taken over by alternatives on the internet towards the end of the 20th century.

### ***Telegram services***

A telegram service is a company or public entity that delivers telegraphed messages directly to the recipient. Telegram services were not inaugurated until electric telegraphy became available. Earlier optical systems were largely limited to official government and military purposes.

Historically, telegrams were sent between a network of interconnected telegraph offices. A person visiting a local telegraph office paid by the word to have a message telegraphed to another office and delivered to the addressee on a paper form. Messages sent by telegraph could be delivered by telegram messenger faster than mail, and even in the telephone age, the telegram remained

|         | American<br>(Morse) | Continental<br>(Gerke) | International<br>(ITU) |
|---------|---------------------|------------------------|------------------------|
| A       | •—                  | •—•—                   | •—                     |
| Ä       | •—•—                | •—•—•—                 | •—•—                   |
| B       | •—•—•—              | •—•—•—•—               | •—•—•—                 |
| C       | •—•—•—•—            | •—•—•—•—•—             | •—•—•—•—               |
| CH      | •—•—•—•—•—          | •—•—•—•—•—•—           | •—•—•—•—•—             |
| D       | •—•—•—•—•—          | •—•—•—•—•—•—           | •—•—•—•—•—             |
| E       | •—•—•—•—•—          | •—•—•—•—•—•—           | •—•—•—•—•—             |
| F       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| G       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| H       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| I       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| J       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| K       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| L       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| M       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| N       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| O       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| Ö       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| P       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| Q       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| R       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| S       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| T       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| U       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
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| Y       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
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| 8       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| 9       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| 0       | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |
| 0 (alt) | •—•—•—•—•—•—        | •—•—•—•—•—•—•—         | •—•—•—•—•—•—           |

popular for social and business correspondence. At their peak in 1929, an estimated 200 million telegrams were sent.

In 1919, the US Central Bureau for Registered Addresses was established in the financial district of New York City. The bureau was created to ease the growing problem of messages being delivered to the wrong recipients. To combat this issue, the bureau offered telegraph customers the option to register unique code names for their telegraph addresses. Customers were charged \$2.50 per year per code. By 1934, 28,000 codes had been registered.

Telegram services still operate in much of the world , but e-mail and text messaging have rendered telegrams obsolete in many countries, and the number of telegrams sent annually has been declining rapidly since the 1980s. Where telegram services still exist, the transmission method between offices is no longer by telegraph, but by telex or IP link.

~

*Left: The three versions of Morse Code, including the ITU International Morse that we use today as Amateurs.*

Congratulations to all the graduates of our CW course! Keep practising to build that speed. In July 1939 at a contest in Asheville, North Carolina in the United States [Ted R. McElroy](#) W1JYN set a still-standing record for Morse copying, 75.2 wpm. McElroy began his career at Western Union as messenger when he was fourteen years old. He graduated from Forster Grammar School in Somerville, Massachusetts in 1916, and in that same year he enrolled in the Commercial Course at Somerville High School. He became a telegraph operator at the age of fifteen and received his commercial radio operator's license at the age of nineteen. McElroy won contests for receiving speed code and setting records when he was 21 years old. He was the first radio receiver to record a speed of more than 50 words per minute. For his accomplishments McElroy was awarded a silver cup that was inscribed "Presented to the Champion Radio Code Operator of the World."

McElroy showed a demonstration of receiving 77 words per minute in 1935. He received a letter by the Cape Cod Radio Club attesting to this fact. The Club initially checked his speed with the 18-dot standard and recorded his speed at 90 words per minute. When the 21-dot standard is applied then his speed is computed to be 77 words per minute ( $18/21 \text{ times } 90 \text{ wpm} = 77 \text{ wpm}$ ). McElroy showed a speed of 75 words per minute in the Boston "World of Tomorrow" exhibition on 16 November 1938, although it is not counted as an official contest. He demonstrated a copy speed of 75.2 words per minute on 2 July 1939 at the Radio Club in Asheville, North Carolina. McElroy was named to Philadelphia's Morse Telegraph Hall of Fame in 1964.



*Our 2022 CW Course.  
Instructor Kevin McQuiggin VE7ZD*





My wife and I recently decided to get our Colombian radio licenses. Yes, it's a license there, not a certification like it is here. She's Colombian. I'm not, but I love Colombia and we used to spend half the year there before Covid messed with our lifestyle. Anyway, we passed. Isa and I are now officially HJ1ZEB and HJ1ISI in addition to being VA7ZEB and VA7ISI. I thought I'd share a few observations.

First, their test is one of the most difficult I have ever ever taken. Colombia has taken a very different approach from Canada's. Their attitude is, if you're an amateur radio operator representing their country, they want you to be a well educated, knowledgeable person, so their test contains all kinds of trivia that has nothing to do with radio. You need to know such things as: What is the capital city of Hungary? What was the greatest work of Gabriel García Márquez? What capital city has the highest altitude in the world? Which planet is closest to Earth? What is the longest river in Europe? Which countries did the Mayans occupy?

Before you ask: Budapest (not to be confused with Bucharest, the capital of Romania), Cien años de soledad (which he won a Nobel Prize for), La Paz (Bolivia), Mercury, the Volga (it's almost 700 km longer than the Danube), and Guatemala/Honduras/Mexico (they also existed sporadically in a few other places, but those were the top three).

They also ask radio questions too, but I won't list any of those as they were pretty standard. The test was online, in Spanish, and my Spanish is far from perfect. I did well enough to pass, but not by much. Passing was 65 out of 100 and I got 76.

The downside to their approach is that their radio community is far smaller and less active than ours. They don't have the kind of clubs we have, and obviously they therefore don't have the club events that we have. I've often thought that if I ever have to move within Canada, it would probably take me very little time to make new friends, just by joining a radio club or two wherever I went. This isn't real -world in Colombia. They don't even have active radio Facebook groups like the one I'm posting in.

The upside is that, if you encounter a Colombian ham, he's probably a pretty smart guy.

Note the expiry date on my license. In order to avoid the situation we have in Canada where most call signs are held by people who haven't touched a radio for decades, the Colombians make you take another test after 5 years and they have a nominal annual fee (\$5 or so) to keep yourself active in their system. There are obviously pros and cons to both approaches and I'm not taking sides, just noting the difference.

For the first five years, Colombian amateurs get HJ1 prefixes. After five years, you take the advanced exam and you graduate to an HK1 prefix. Your suffix remains the same. Isa and I will almost certainly never change our call signs in either Canada or Colombia because they nicely match.

Anyway, we did this. I'm not going to lie, it's probably useless, but I'm happy we did it anyway. I'm heading to Bogotá in September for a few days and I'll give my new call sign a workout in my tortured and stiff Spanish. I'm looking forward to it.

~ Reg VA7ZEB/HJ1ZEB

# Page 12—News You Can't Lose

## *Is your radio vulnerable to outside control?*

To what extent are you really in control of your radios? Can someone else control them, perhaps shutting them down or limiting what you can do with them? In our IoT (Internet of Things) world things are open to purposeful and inadvertent control.

Some examples:

### **A 2022 Military Action event:**

"As Russian troops invaded Ukraine, alleged Russian military hackers targeted the Via-Sat satellite system, deploying wiper malware that bricked people's routers and knocked them offline. Around 30,000 internet connections in Europe were disrupted, including more than 5,000 wind turbines." - *Wired*, 18 Aug 2022

### **A boo-boo car issue:**

"They drove a 2014 to 2017 model Mazda, and they had tuned into KUOW, 94.9 on the FM dial, the NPR station.

That's all it took.

Somehow the signal the station sent to the modern HD Radio that's part of the Mazda infotainment center had, as Welding puts it, "fried" a major component. That frying made the radios only play KUOW. No chance of catching a little classic rock or some Dori soliloquies. KUOW. Forever. Also gone from the infotainment center were such features as Bluetooth, navigation, the clock and vehicle stats — "Many of the features I paid for when I bought it new," Welding says." - *Seattle Times*, 11 Feb 2022

### **A personal one:**

The XYL's EV needed updating, done over the air. Update went well until two weeks later when about half of the "nice to have features" suddenly stopped working, putting the vehicle into a "basic mode" where it does drive and charge, but not much else.

The dealer and the manufacturer have the "Top Men" working on it as I type.

### **A computer one:**

We learned via Microsoft's Raymond Chen that back in the olden days of Windows XP, it was discovered that a music video of a song called Rhythm Nation by Janet Jackson was causing Windows PCs to crash. This is because the song in question contained resonant frequencies for 5400 RPM hard drives, which even crashed PCs in its vicinity while the song was being played. While OEMs eventually fixed the issue, security agency MITRE has now declared it as an official exploit. - *Security Discussions online and Tom's Hardware*

<https://www.tomshardware.com/news/janet-jackson-video-crashes-laptops>

### **A radio one:**

If Microsoft Azure servers have an issue, or the Auth0 security part gets jiggled my remote station is DOA. So what if your radio is set up to shutdown on receipt of a certain signal? Or could be controlled by something through its internet connection?

What do we control and what is controllable by others? What if the services that are needed to run your station disappear? Is there any workaround when services are disrupted? What happens if the support goes away or is abandoned?

Pretty fair questions that likely are not completely answerable. It doesn't make sense to forego all modern-conveniences to avoid the exposures. But you should have a "Plan-B" in mind. One strategy is to keep a set of radio gear that is old enough and simple enough to sidestep the exposure.

~ Steve K9ZW

[Is your Radio Vulnerable to Outside Control? | With Varying Frequency - Amateur Radio Ponderings \(wordpress.com\)](https://www.amateurradioponderings.com/2022/09/12/is-your-radio-vulnerable-to-outside-control/)





# Page 13—News You Can Lose

## The Lighter Side of Amateur Radio

### ***“No More Monkey Business”***

***- Says ARRL Contest Manager***



**Newington, CT**—A recent undercover operation has exposed some questionable operating techniques at big gun contesting stations. Posing as visiting operators, our reporters presented ARRL with videos of operators wearing adult diapers to maximize operating time, taking Red Bull intravenously and, most disturbingly, using trained monkeys to operate digital modes.

ARRL Contest Manager, Dwayne “Dupe” Checker, K1NFW, said he had thought such stories were just tall tales, but the secret footage clearly shows monkeys making digital contacts during the recent ARRL digital contest. In an announcement from ARRL HQ he stated, “We simply cannot allow this monkey business to continue. We are hams, not monkeys!”

But the station owner in question said there is no requirement in the rules that an operator must be a human. “Besides, the monkeys all passed their Technician exam, which thankfully was multiple choice, so with so many monkeys taking the test, it was just a matter of time. We just happened to be first.”

The ARRL complaint is now going to court in what is expected to be the most watched monkey court case since ‘Monkey #13 vs Michael Jackson.’ Mr. Checker,

speaking from ARRL’s Newington CT headquarters, and surrounded by a team of celebrity lawyers, said, “We have to do this. Our membership expects us to do this. If we let monkeys operate digital modes - what’s next? CW? What if we have parrots saying ‘59 Florida’ in SSB contests? It’s not right. It’s not natural. It’s not **REAL HAM RADIO** and it’s not going to happen!”

We will provide daily updates from the courtroom. The trial is set to start April 1, 2023.

*- Adrian VE7NZ reporting*





Tom Cox VE6TOX



## INTRODUCTION

This article is for amateur radio operators providing situation updates for event, exercise, emergency, or club communications support over radio or by visible display to increase common situational awareness, increase efficiency and assist decision making.

Okay.

While most people think of situation reports primarily occurring in battle, during emergencies, or during exercises, they occur in virtually any context more often than you think. The first paragraph is an example giving you a context, informing you who the article is for and when the article may apply. It is brief, at the beginning, and advises you of a current situation. It is a situation report.

But the second paragraph, the one-word “okay” is a situation report as well. The first point about situation reports is the context is everything. “Okay” in response to “How are you this morning, dear?” or a co-worker’s “How did the meeting go?” is significantly different than the context of the question and answer in “I know your house burned down two days ago – how are you doing?”

The importance of situation reports when you understand that communications failures feature in most after-action reports and disaster inquiries and that the majority of communications failures are human-caused mistakes in what we say or what we hear.<sup>1</sup>

Like virtually anything in life, there is much more than meets the eye. Where a simple “Okay” may be an appropriate situation report to a

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He received his first ICS training as a volunteer with the City of Vancouver and the Vancouver Emergency Community Telecommunications Organization (VECTOR).

<sup>1</sup> There are sixty specific ways that communications fail and the majority fall in the category of “Human Caused”. See The Communicator, Jan-Feb 2022 Issue, pages 15-23 <https://bit.ly/SARC22JanFeb>

friend or co-worker, “Things are Not Okay!” is completely inadequate for a public warning or progress report during an emergency. We need to understand more about content, timing, accuracy, and nuance.

Let’s define what a situation report is, provide you with a relatively fail-safe method to construct situation reports that you can do and use off the top of your head, and take a look at some of the issues, complexity and nuance of good situation reports.

### **WHAT IS A SITUATION REPORT?**

“The Situation Report (SITREP) is a form of status reporting that provides decision-makers and readers a quick understanding of the current situation. It provides a clear, concise understanding of the situation—focusing on meaning or context, in addition to the facts.”<sup>2</sup>

The dictionary definitions of a situation report, or “sit rep” include “a periodic report of the current military situation” and “A report or update on a particular state of affairs, or on the progress of events in a particular situation.”

A broader definition would state “A situation report provides a specific set of information at a specific point of time to a specific target audience, within a specific context.” The introduction to a magazine article, the reply to a “How are you doing?” to emergency public warnings, frequently asked questions (FAQ) or a project update or annual general meeting presentation would also meet all three definitions.

Each definition includes another essential element of situation reports:

- It assumes that the situation is changing
- The reports must be done periodically to be of most use.
- The report focusses on context, current situation, and progress/changes
- It is required for making decisions or re-orienting to a problem or situation.

What is not stated, but must be assumed:

- It must be brief
- It may or may not be accurate or verified.
- It provides one perspective – that of the originator

### **STANDARDIZED FORMAT**

Situation reports often need to be crafted in dire situations, with little information, and for a variety of audiences. As well, people who do not regularly create such reports often end up being the ones to create them.

After all these issues and challenges to writing situation reports, how do you make this easy and fast for everyone in your organization? A standardized format will speed things up, identify missing information, and provide feedback. If done correctly, it is easily created, easily updated, easily verified, and easy to use, along with easily displayed

How do we make it dead simple so that people with minimal training can create situation reports effectively and efficiently? Tap into what they already know and do!

Almost everybody has learned “Who, What, When, Where, Why and How?”

<sup>2</sup> <https://thepersimmongroup.com/situation-report-sitrep-template/>, April 3, 2016

<sup>3</sup> <https://www.merriam-webster.com/dictionary/sitrep>

<sup>4</sup> [https://www.lexico.com/definition/situation\\_report](https://www.lexico.com/definition/situation_report)

<sup>5</sup> I am not going to get into a debate as to whether or not annual general meetings are the same as a “current military situation”...





If everyone knows the phrase, then use it. Make it the format for every situation report.

You can always add more detail, but the “Who, What, When, Where, Why, and How” format has numerous advantages:

- Almost everyone knows it, so it doesn’t take training to use it immediately.
- It covers the majority of the required essential information
- It provides consistency for creating, sending, and receiving information
- Missing one item immediately identifies missing information or a gap.
- It is fast for people to receive as they already have the format and understand what comes next.
- It is easy to update (whiteboard/ computer)
- It is easy to add to
- It is easy to verify and identify what has not yet been verified (check-marks)
- It is easy to time-stamp
- It is easy to display
- It is easy to use the information

With a blank piece of paper, I can create a situation report, an emergency public warning, a progress report, or an outline of a presentation. Within two minutes, I can tell ARES members what the emergency is, what is being done about it, and what we need to do.

Let’s give you an actual incident as an example...

## 5W&H ON AN INCIDENT



*Edmonton May 5, 2005 Enviro-Chemicals hazardous materials Incident*

When this Incident occurred, I happened to be at the City of Edmonton Emergency Operations Centre (EOC). I activated the EOC Amateur Radio Station and started an ARES Emergency Net. There are four “situations” critical to understanding an emergency response. First is “What is the Incident/Hazard?” Second is “What is being done about it by responders?” Third is “What must the affected public do?” Finally, we need “What is ARES doing to support the city and what do you want ARES members to do?”

We put this up on a whiteboard in the station so that any net control could see it, read it, and update it at any time. This display was important to amateur coming into the room to help, but what surprised me the most was that EOC staff were coming in to get updates. When I asked the Planning Section Chief for the City why he kept on coming into our room, he stated “You are the only people getting information from the site. We haven’t heard from the Incident Commander for hours (not uncommon). I don’t even know which way the smoke is blowing!”

That was a powerful understanding for me. Even those supporting a potential evacuation may not be getting the situational awareness they need and displaying what we knew was helping awareness for those making the key decisions.

So, what did we have on the whiteboard? The four situations critical to understanding the emergency response. What is the Incident? What is the current response? What do we need the public to do? What is amateur radio doing?

Now for the first nuance: While the “When?” of an Incident would appear to be the time the Incident occurred or was first reported, that is not the key “When?” of a situation report. The time that the Incident started is important, but it is static. It only occurs once at the start and for the duration of the Incident. I would put that as part of the first “What?”

### THE INCIDENT

Who: The City of Edmonton

What: Hazardous Materials fire at 15:00 *(note the time of the Incident is embedded here)*

When: *[Insert time of the update]*

Where: *[Exact location]*

Why: Fire, toxic smoke, unstable incident, possible evacuations.

How: Unknown (i.e. “How did this Incident occur?”)

### THE RESPONSE

You need another column!

The second column describes and tells all of the emergency response already occurring:

Who: Edmonton Fire Rescue and other emergency services

What: Responding/Arriving/On-scene/Have established command

When: *[time of update]*

Where: ICP at *[x location]*, with staging at *[y location]*.

Why: Due to fire, toxic smoke, possible rescues, and possible shelter-in-place and/or evacuation.

How: *[Provide specific response instructions such as ICP, staging, mutual aid, ECC activation, public warnings]*

### DESIRED PUBLIC RESPONSE

You need another column!

Desired actions of the affected public:

Who: Residents in the immediate area

What: Shelter in Place and prepare for evacuation

When: *[time of update]*

Where: *[Exact street/map locations]*

Why: Extremely toxic smoke, risk of explosion, and risk of fires spreading

How: *[Specific shelter-in-place instructions], {specific prepare for evacuation instructions}, and [specific community evacuation instructions such as bring pets, neighbours, call for assistance]*

### THE AMATEUR RADIO RESPONSE

You need another column!

Desired action of ARES members in support of this Incident and response:

Who: ARES volunteers

What: Wishing to assist.

When: *[time of update]*

Where: 146.940 – A Frequency rather than a location! Make it work for what you do!

Why: Evacuations, observation, support of the ECC

How: Do not check in unless you are immediately deployable (within three minutes). Complete your ARES checklist, clear work/pet/family commitments. Have a full tank of fuel and spare batteries. Be prepared for a 12-hour remote deployment with minimal or no support.

So, how does this sound on the air?

*“All stations, all stations, all stations. This is VE6EEE, Net Control for the ARES net in support of the City of Edmonton. A hazardous materials Incident, involving fire, toxic smoke, and an unstable Incident possibly requiring evacuation is occurring at 9511-17th Street in east Edmonton. The City of Edmonton emergency services are responding.*

*Public in the nearby area are asked to shelter-in-place and prepare for possible evacuation. ARES volunteers wishing to assist in support of the response and possible evacuation, should check in on 147.020. Complete your ARES checklist, clear work/pet/family commitments. Have a full tank of gas and spare batteries.*

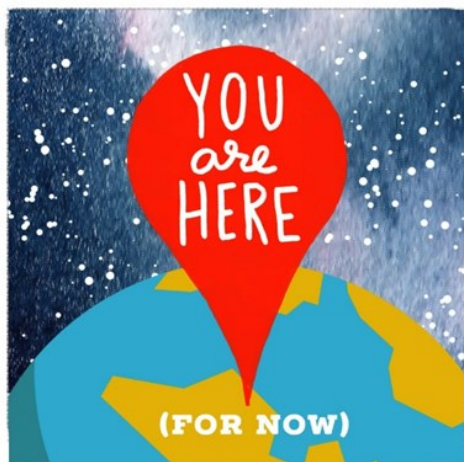
*Be prepared for a twelve-hour deployment with limited support. Do not check into the net unless you can deploy within three minutes.”*

information, or make a reasonable assumption that the information was current.

As all of this was on a whiteboard, it was easy to update. As missing, updated, or verified information came in, we could update the board and update the time of update so that anyone entering the room could immediately see.

### ISSUES AND DETAIL

- **Who is it for?** Internal, external? Is this for the police to organize the response, the executive to organize the support to the response and identify secondary impacts or is it for external partners coming to support the first two? What may be important to one group may be incidental or unnecessary for another organization.
- **When is it prepared?** How often should situation updates be shared? Once an hour, once a shift, once a day, once a week? While it obviously depends on the speed and nature of the Incident. When lives are at risk, information even hourly may be too late.
- **Time Stamp.** When providing situation reports, there are only two “times” that count; the time that the Incident occurred and the time that the update was created. The time of the Incident tends to be a single, static point. As a result, while it is important Incident information, it is not the most important update information. Understanding that an Incident started one hour ago or one day ago or one week ago is important information for orienting the needs and phase of the response, but it is different from identifying time-sensitive information such as warnings, response, and re-entry information that may occur subsequently. As a result, for situation reports, only two times count; the start of the Incident and the current time of the specific Incident report.



That’s a lot of information in a very short amount of time. You will note that not all the information from all four reports was provided over the air. But anyone could identify what was not stated (such as the time of all the reports) and could inquire, add



- **Who approves/authorizes?** In ICS, the Incident Commander is supposed to approve the release of all information. But does the IC have the ability to read all information being released and do they have the ability to verify all information. At the Emergency Coordination Centre or agency executive level, other issues arise. The control of information may impede the ability of the response if information is not allowed to flow freely. In Canada, the Strathcona County parkade bombing<sup>6</sup> or the Nova Scotia active shooter Incident<sup>7</sup> both resulted in information not being release due to verification and distribution policies. This article does not make any recommendation on best practices as both the release of information and the withholding of information have proven to have negative consequences. If you are looking for a happy answer, you will not find it in emergency management.
- **Who prepares it?** Amateur radio net control often creates the situation reports for their nets. The Planning Section (Situation Unit Leader) is supposed to prepare the Situation Status form 209 for the needs of the responders. The Information Officer is supposed to prepare the information for the needs of the responders and response support organizations. The Public Information Officer is supposed to provide information to the affected and interested public through the media. Supervisory personnel are to provide information for their subordinates. In every situation, different target audiences will find different people preparing similar, but not identical, information for different purposes.
- **What is known?** By stating what is known, you can also state what is not known or leave that implied. The importance of this is that it allows the addition of information to fill any gaps. “We are aware of five

fatalities” may result in an update from the field of “I can see eight fatalities at my location”. “We have damage from 50th street to 17th street and 82nd Avenue to Hermitage Road may elicit further reports of damage outside those areas.

- **Spread and Prognosis.** Is the Incident contained or spreading? If the Incident is contained, then urgency may be reduced and the focus will be on current issues and eventual clean-up. If the Incident is spreading, however, the information demands will go up. Who will be impacted next? Have warnings been issued? How fast it spreading? Can we get a response there in time? How many more people will be impacted and what workload will that create? People need to know if it is a spreading or cascading Incident.

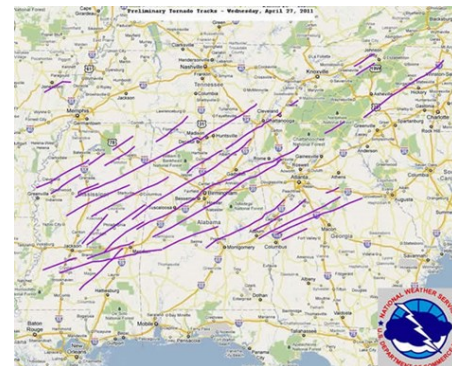


Figure 1 - Tornado Paths 2011

There may be some debate as to whether or not to provide a prognosis (improving or deteriorating). Should a situation report make an estimate of whether a situation is improving or not? Who makes that call? I strongly believe that a prognosis is important to help people understand if help is needed, when help is needed, and how much commitment is required from individuals. If you put a prognosis in, please be sure that it is approved by Emergency Coordination Centre, Incident Commander, or other authority.

- **What level of detail?** The ICS form 209<sup>8</sup> Incident Status Report is one example of a situation report. With 53 specific sections,

<sup>6</sup> <https://globalnews.ca/news/5237482/internal-emails-strathcona-county-explosions-communication-rumours/>

<sup>7</sup> <https://www.cbc.ca/news/canada/nova-scotia/public-communications-replica-cruiser-jen-clark-testimony-1.6480007>

<sup>8</sup> [https://www.icscanada.ca/images/upload/forms/2017%20Forms/Form%20209\\_1.pdf](https://www.icscanada.ca/images/upload/forms/2017%20Forms/Form%20209_1.pdf). ICS Canada forms are publicly available at <https://www.icscanada.ca/en/Forms.html>.

the ICS form 209 asks and provides for hundreds of pieces of information including the number of people missing, the number of people trapped, the number of people requiring immunizations, the number of responder fatalities, and estimated Incident completion date. While the information provided is comprehensive, it is more than most organizations require and too much to read out over the air.

- **What is included – and what is left out?** The 209 does not track all critical information. The 2021 floods in B.C. had hundreds of thousands of animals on farms impacted, but the ICS form 209 does not track livestock fatalities, injuries, evacuations, or needs. While it tracks estimated Incident costs (which may not be important to most people), it does not track utility outages or Incident stabilization issues such as critical infrastructure. It is up to the person crafting the situation report to determine what the intended audience will need or not need.
- **Prioritization of information issues.** Is it more important to provide what has been damaged or what has not been damaged? This seemingly simple question is associated with “If we haven’t heard about it, is it not an issue?” Assuming that if it has not been mentioned means that it has not been impacted is one of the biggest failings of emergency management. Quite often, the worst hit areas are the last to be responded to because they have not been heard from. If it has not been heard from, is it unaffected or devastated. Sometimes knowing what is not impacted is just as important as what has been impacted. One story from Hurricane Katrina was a city of 15 – 20,000 people who did not get response for over a week. When asked “Why didn’t you call for help?” the reply from the sheriff was “You haven’t heard from a city for over a week and you never

thought to check?” is a typical example of failing to look for black holes.

- **Current issues.** Rather than have anyone guess what your current issues are, why don’t you state them explicitly during the situation report. If you have too few or too many volunteers, if the situation is changing too quickly for you, if you don’t know which way the toxic smoke is blowing, state it! You cannot get help for issues if you don’t identify them and people cannot fill the gaps if they don’t know what the gaps are.

### **MUST INFORMATION BE VERIFIED?**

You cannot reach any of the people in the Slave Lake Emergency Coordination Centre. This picture of the Town Offices/EOC building is being broadcast on multiple national news networks. Should you get verification?



You cannot win a war waiting for information to be verified. Decisions must be made in the absence of information. People don’t like that, governments don’t like that, and inquiries don’t like that. Ideally, information will always be verified before being sent. The reality is that that may be impossible. There are a number of reasons for this.

First, verification takes time and resources, neither of which are in abundance during an emergency. By the time something is verified, the information is too late or no

longer current. Remember the old adage about projects? “You can have it fast, you can have it good, you can have it cheap. Pick two.” In emergency management, it comes down to two choices: “You can have it fast or you can have it good. Pick one.”

Second, it is impossible to verify everything, especially in a fast-moving situation. Information and data transfer go off the charts anytime society needs to re-orient itself to a new emergency situation. With 15,000 people evacuating during the Slave Lake wildfire, the amount of information coming in exceeded any single person’s ability to get it all, let alone comprehend and action it all. Given you may have too much information all at once, how do you intend to verify all of it? What needs to be verified when you don’t know who needs it?

Finally, who is the audience? While a situation report may be intended for one audience, there is no guarantee that any other person or organization won’t take that information for other purposes. A situation report preparing for the evacuation of neighborhood might be misinterpreted as an evacuation order by others hearing that information. A voluntary evacuation order might be interpreted by the public to mean there is little risk when mandatory evacuation orders are also being made. Information that is verified for one audience (“Evacuation planning has started”) may be misunderstood by another audience (“Evacuations have started”). You can verify what you have provided, but you cannot control how it will be understood.

Verification is important and recommended, but verification may be impossible. Verification is an ideal that cannot always be met. Rather than treating verification as an absolute, why not treat it as the variable it is? Put a check-mark beside any information that has been verified and a question mark (or blank) beside any information that has not yet been verified.

If verification of information is important, make it an important part of your situation report.

## DISPLAY OF INFORMATION

The capture of information is not the same as the display of information. Information must be shared to be usable. Yet, emergency management consistently captures information (computers, logs, after-action reviews) but does not display it to make it usable by people coming into the station, whether amateur radio operators or responders.

**VE6GMS AMATEUR RADIO (ARES)**

|                                                                             |                                        |
|-----------------------------------------------------------------------------|----------------------------------------|
| INCIDENT NAME: <b>HOCKEY</b>                                                | DATE: <b>STATIONS</b>                  |
| ARES STATUS: <b>Stood Down til Sat</b>                                      | We Can Contact for you:                |
| OPERATIONAL PERIOD: <b>1800-0200</b>                                        | "TACTICAL" (location) OPERATORS        |
| INCIDENT OBJECTIVES:                                                        | EOC/NET <b>NCR MVP</b>                 |
| ① Voice Link between the EOC and ICP                                        | "The Rock" (ICP's source)              |
| ② Amateur TV f - Air 1 to the EOC and ICP                                   | Strathcona (Police Station) <b>TOX</b> |
| ③ Voice links to Strathcona Police and Staging Areas if available operators | I/C                                    |
| CURRENT ISSUES: <b>None</b>                                                 | Spec 1                                 |
| SAFETY MESSAGE:                                                             | Spec 2                                 |
| ① Mandatory Roll Calls and Situation Reports                                | Logistics/Planning                     |
| ② Log EVERYTHING                                                            |                                        |
| ③ "No Go" within 3 blocks of White Avenue unless assigned                   |                                        |

June 10, 2006 - Edmonton ARES support to the city during the Stanley Cup run.

Here you can see additional information that may not be available in a situation report, such as stations that are operating, Incident Objectives for the amateur radio support, a safety message, and current issues. This is another example of a situation report for responders.





*Silence is deadly during incidents. It may indicate a failure of the mode, an impact on a station, a surge of activity behind the scenes, or it can simply mean bored radio operators are too bored to focus on doing a good job.*

## UPDATING

As the Incident progresses, the information needs change.

In a dynamic and dire situation, updates must be more frequent. If lives are threatened, you must update and broadcast the information as soon as possible to have maximum effect. But as the situation stabilizes, the frequency of updates can be reduced.

Moving to regular updates and specific regular times (e.g. on the hour) are more likely once the life/safety and Incident stabilization priorities have been met and the Incident is focussing on property, environment, and re-entry priorities. Updating the time stamp, even if none of the information has recently changed, indicates that the information is current.

What information is important changes with time. Having the time the Incident occurred may be important the first few hours or the first day, but six weeks into an Incident, nobody cares that it occurred at 10:00 in the morning over forty days ago.

Consider adding phrases such as “This information is current as of X-time today” or “The information will be updated after the Emergency Coordination Centre briefing held at 20:00 to 20:30”.

## SILENCE

I once was travelling to the evacuation of 30,000 people and used my amateur radio to connect with the local repeater being used for emergency operations. When I asked “I am coming in to assist with the evacuation centre, could you give me

a situation report?” The answer was “Nothing much happening here.” I don’t care that you have nothing to do; I need to know what is happening with the 30,000 people who were just evacuated.

There are two issues that need to be addressed. First, unless you are specifically talking about your situation or the operations at your specific station at that specific time, then a situation report is on the entire situation – not just you or your stations’ situation. The “big picture” situation must be prepared, updated, and ready at all times for anyone who needs it. Your situation or an update on how well things are going at your station can be done on the fly. Use the exact same format, but it is the situation you are experiencing that exact minute.

Silence is deadly during incidents. It may indicate a failure of the mode, an impact on a station, a surge of activity behind the scenes, or it can simply mean bored radio operators are too bored to focus on doing a good job. In a dynamic incident, regular updates should be provided to update people on the situation, allow input to confirm or update details, and continue to give a good sense of the “direction” of the Incident (getting better/getting worse). Yes, it may be 04:00 and it’s unlikely anyone is up and listening, but do a good update anyways. I have had a few people say “I turned on the radio and heard the update about ten minutes later explaining the situation. You guys were really appreciated, and professional!” They didn’t want to get on the air and interfere, so we didn’t even know people were listening.

It will be up to you to decide how often to provide updates. During an active Incident, perhaps once an hour to keep everyone in sync. Overnight, perhaps every fifteen minutes just to show the frequency is in use, the station is active, and people know they can contact you. Just don't leave total silence.

### SKILL

Like any skill, situation reports take practice. Yet, the speed and simplicity of a good situation report lends itself to practice on any weekly net, any public event, any exercise, or any emergency.

As well, situation reports should be generally self-critique-able...meaning, "Anyone should be able to identify what is missing." Whether it is the ICS form 209 (Situation Status) or the informal 5W&H, a standardized format allows both parties to immediately identify if any "box" is missing or left unfilled.

### CONCLUSION

The first critical understanding of situation reports is "Who is this information for?" Secondly, you must provide some context to understand the situation being provided. The three ICS Priorities can be used to state "There is currently a threat to [lives, public safety, incident stability, property, environment] due to a [insert hazard]"

The standardized format of "Who, What, When, Where, Why, and How?" provides a universal format that needs no training. It immediately identifies missing information and verified information is as easy as a checkmark beside anything verified. Add a new "Who, What, When, Where, Why, and How?" for each new topic and expect that there will be lots of them during an emergency.

Display of information is as important as passing information. A whiteboard or flipchart paper can capture the information for display and is easy to update. Post it where you and others can see it easily and everyone will benefit.

Use the "When" to time stamp when the information is updated. Regular updates improve the quality of the information, helps solicit updates, provides context and situational awareness and prevents long silences when a net is, in fact, still active.

Like APRS, net control, fox hunting, phonetics, Morse Code, and formal messaging, situation reports are a skill set that must be practiced to be maintained. Like any skill, training, knowledge, and experience will make you better at it.

Okay?



Watch Tom's Seattle Emergency Communications Academy presentations at:

[https://youtu.be/yGe\\_mRjsC\\_M?t=27039](https://youtu.be/yGe_mRjsC_M?t=27039)

# Radio Ramblings

## Using Drones to Augment Amateur Radio Operations

Kevin McQuiggin VE7ZD/KN7Q



Welcome back, and I hope that everyone had a great summer. I spent a lot of time on the air and in development of my station here in Burnaby and hope to relate a lot of my experiences over the summer this season in The Communicator.

This month I'd like to look at the use of drones in support of amateur radio activities. I bought a consumer-grade light drone last February and have been surprised at the utility of these little devices. I see all sorts of supportive roles for them in amateur radio organizations, field operations, and to individual hams. Drones are also great fun once you learn to fly them properly and safely.

I am by no means an experienced drone pilot, but my little drone has helped me with antenna inspection, site inspection, provided aerial photographs for The Communicator on three occasions, and provided video for a couple of SARC and SEPAR events in the community.



Figure 1 - A Modern Drone in Flight

They can add a lot of capability to amateur radio operations, so I thought this would be a good topic for this month's column.

### Modern Drones

The modern drone is a remotely piloted quadcopter: a tiny aircraft with four propellers that support the aircraft and allow it to navigate under control of the human operator [1]. Unlike the complex, bulky and unstable drones of the past, these consumer-grade devices are stable, lightweight, and (with proper training and practise) easy to fly.

Flight stability and position control are provided by an onboard GPS receiver. A 2.4 GHz spread spectrum radio on the drone accepts command inputs and provides a sophisticated telemetry downlink back to the ground for the human operator [2]. The user interface to the drone is provided by a hand controller with two joysticks that act as flight controls and several configuration switches. [See Figure 2]. The controller connects to your smartphone, and the phone runs an app which provides real time video, mapping, and airspace information for the drone pilot. [See Figure 3].





Figure 2 – Controller with Smartphone Attached

The drone is equipped with an HD camera and can shoot high-definition video as well as take photographs. Realtime video is downlinked to the pilot so that she can “see what the drone sees” and control the flight.

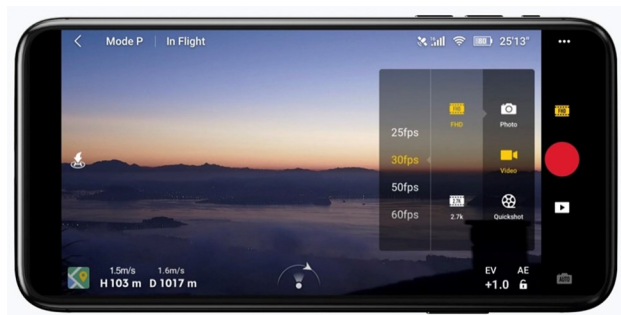


Figure 3 – Smartphone App

Flight specifications on these devices are impressive. They can operate at very high altitudes and at great distance from the human controller, so much so that federal aviation regulations have been introduced to ensure that these light drones do not interfere with other aviation traffic [3]. Drone pilots must be aware of aviation regulations, respect altitude limits and always operate their drone within visual line of sight. I will have more to say on this below.

Light drones are battery powered, and because of improvements in battery technology they can now fly for times on the order of 30 minutes before needing to land and recharge.

An interesting technological feature is that the drone records its starting location (from onboard GPS) on take-off, and if either the battery reaches a predetermined low voltage, or if the drone loses radio contact with the operator it will “return to starting point” autonomously and land. The computer in the drone determines minimum battery level in real time based on the distance the drone is from the starting point, to ensure that it will not run out power during the trip back!

The amount of sophisticated technology on these devices is amazing for their size. The designers of these aircraft have done a fantastic job.

### ***How Can a Drone Assist Amateur Operations?***

A light drone can assist ham radio operations in many ways. Here are just a few things that you can do with your drone:

- Help you inspect your antenna systems by giving you the ability to inspect things like connectors, feedlines, and antenna supports close up (really close up!) from the ground;
- Take photographs or shoot high-definition video of your QTH from an elevated point of view;
- Examine the effect of terrain or obstructions on RF signals from a particular location;
- Shoot aerial high-definition video of amateur radio events like Field Day, other community events, or in actual emergency situations provide incident commanders with real-time information;
- Carry lightweight line aloft and over trees or other support structures that will then

allow deployment of antennas with more precision than using the traditional slingshots and “air cannons”. Such usage will depend on your drone’s payload capabilities and aviation regulations;

- Carry very light wires aloft as an antenna support, for example for a 160m or 80m vertical. Your drone could be directed to “park” at high altitude while you try that 160m vertical to see how it works. Modern drones have flight times on the order of 30 minutes before their batteries require return-to-home, so that would give you sufficient “parked” time airborne to make a few QSOs;
- Many other fun and useful functions.

### ***How Did I Get Involved?***

I had heard of drone flying as a hobby and was aware of the extensive use of drones by the entertainment industry and in the commercial world, but had no personal experience with them. I was under the impression that they were extremely expensive, technically complex, and difficult to fly.

I must credit my long-time friend Rick Streifel, VE7AA for giving me an introduction to light drones. I am a member of an informal amateur radio group that meets once or twice a year at local parks where we talk about our recent amateur radio activity and bring radios and other devices that we think the other members might be

interested in. Rick brought his drone to our meeting in February, and part of his presentation was to give it a short flight and let the other participants give it a try if they wished.

Rick’s drone weighed less than 250 grams, and as such was exempt from licensing requirements under Canadian federal aviation regulations [4]. Additionally, although Rick has his drone pilot’s license, operators of drones weighing less than 250g are not required to be federally licensed. These conditions meant that other participants at the meeting could legally operate the light drone, under supervision of course, as we were all inexperienced drone pilots.

I watched Rick flying his drone with much interest and noted its stability, the advanced features on the controller and the smartphone app, and in particular the well-designed user interface and ease with which he was able to fly it.

When I had the opportunity to give the drone a try, I couldn’t resist. Rick talked me through takeoff and basic maneuvering and I cautiously hovered, changed altitude, and maneuvered the drone around the immediate area. While these drones can fly to several thousand feet and many kilometres away from the operator, it is critical that the operator (and a spotter) maintain visual contact with the aircraft at all times. My first drone flight was, at most, only about 30 metres from where I was

operating the device. Rick served as my spotter as I worked to figure out the controls. After some experimentation, I was able to return the drone to our landing area (a picnic table) and use the “auto land” feature in the software to set the device down and stop its four propellers safely.

Enthused, I took off and flew around a couple more times, and then, after asking Rick a couple of questions on drone regulations and cost, made the decision that this was an interesting enough activity to invest some money in. My Amazon order was in the next day!

Until the order arrived, I headed to the ‘net to research drones, regulations, download manuals, and learn as much as I could. YouTube in particular was very helpful: there are hundreds of videos demonstrating both professional (and unfortunately, reckless and foolish) drone flying. You can learn a lot from studying the mistakes of others [5].

Through that percentage of videos giving professional and experienced advice and practical demonstrations, I was able to get a handle on proper procedures, safety, and the importance of being aware of one’s own operational limitations. Drone flying skills need to be developed over time. I watched the instructional videos, read my drone’s manuals, and reviewed the company’s support forums. By Thursday of the following week, I was in possession of my own light drone.

### **More “Photography” Than “Flying”**

One thing that I learned was that drone flying is more focused on shooting high quality videos and taking photographs than on the act of flying itself. This sets drone flying apart from other activities such as flying of radio-controlled aircraft, which focus on traditional piloting skills.

That said, shooting professional quality videos from a drone is extremely difficult, and I surmise that getting my skills to that level will take years of experience. Modern drones, especially light drones like the one that I purchased, have some advanced features that can perform a set of “cinematic” maneuvers at the touch of a button on the controller. These features make it easy for the novice pilot to capture a high quality, movie-like video sequence.

I like to learn how to use new technology myself. I resolved NOT to use these “canned” features, but rather to learn how to perform these maneuvers (such as slowly circling a point or following a moving object on the ground) myself. More on this, in relation to training, below.

### **Culture Clash and Municipal Bylaws**

Drone pilots and radio-controlled aircraft hobbyists usually do not mix, and drones are usually not allowed in places where radio-controlled aircraft are permitted to operate.

In my research I noted that radio-controlled aircraft enthusiasts seem to view drone pilots with at least a small level of disrespect. I think that this is largely because of the perceived lack of flying skills needed to successfully pilot a light drone.

The photographic focus of drone flying also outshines the “stick and rudder” skills that the pilot of a remote-controlled aircraft needs to keep her aircraft flying. I sensed quite a bit of polarization between the two hobbies in my research, and while I do not fully understand this tension, it seems to be a fact of life. I checked out some local and regional radio-controlled aircraft facilities, and “NO DRONES ALLOWED” signs were common.

Many municipalities also seem to have bylaws that restrict the flying of drones. See [6]. The background surrounding these regulations is based on the irresponsible use of drones by underexperienced or problematic operators. Untrained drone pilots have caused their aircraft to collide with members of the public, hit buildings, electric wires, or other infrastructure, and to crash in an uncontrolled manner. YouTube (unfortunately) has many examples of irresponsible (and just plain stupid) drone flying, and the attitude exhibited in the videos by these operators is irresponsible. The responsible novice drone pilot can still use these videos as great examples of how NOT to fly your own drone!

While a light drone weighs under 250 grams, it can still injure people, break windows, or damage infrastructure systems if it is operated poorly. Lack of professionalism or irresponsibility by these drone operators is responsible for creation of these bylaws. It is a true case of “one bad apple” wrecking things for all the other (responsible) apples in the barrel.

Worse than this irresponsible activity is the intentional anti-social, even criminal activity undertaken by some drone pilots who have used their drones to invade peoples’ personal spaces and privacy. Voyeurs have given drones a bad reputation as they have used the cameras on their aircraft to “spy” on people.

This egregious activity cannot be tolerated in civil society, and municipal bylaws restricting drone flying have also taken this into account. Intentional voyeuristic activity by these pilots also violates the Charter and the Criminal Code, and enforcement action is appropriate.

While the few irresponsible operators have restricted drone flights in many municipalities for others, this is no reason not to acquire a drone and learn to fly it competently. There are enough unrestricted areas around to make the activity viable. Plus, responsible use of a drone in a public service context will likely not generate enforcement action by police or municipal officials.



## **Federal Regulations**

As I alluded to above, drones above 250 grams in weight are federally regulated in Canada. Operators need a drone pilot's license that qualifies them to fly in controlled airspace. Drone pilots must file a flight plan and contact the relevant air traffic control authorities to obtain clearance before their flight.

Under 250 grams, a light drone and its operator are not subject to these regulations, but nonetheless it is smart to be aware of aviation regulations and flight rules. Some of these rules are obvious: do not fly your light drone near an airport or in controlled airspace; do not fly near other aircraft; do not "buzz" people or buildings: the list of common-sense rules would be very long. See [7].

Fortunately, the smartphone apps that accompany modern light drones have features which monitor these restrictions and provide flight advice to you in real time. The app will advise you of maximum allowable altitude or if your drone is about to violate controlled airspace. The app will even prevent your drone from taking off or going above a particular altitude if you attempt to violate controlled airspace, a temporary flight restriction, or other aviation regulations. The app uses the drone's GPS telemetry and your smartphone's Internet connection to remain aware of current airspace conditions.

I'm a commercial pilot, and as such am aware of the myriad of aviation rules, airspace designations and restrictions in the Lower Mainland. There are dozens of them. I've been very impressed with the app's ability to keep up with airspace changes and even temporary flight restrictions. If you pay attention to what the app tells you, it is hard to "make a mistake" and violate controlled or restricted airspace.

## **Learning to Fly**

Once my drone was in hand, I decided that I would first try to develop my flying skills in the backyard before heading out to any other locations.

As noted above, I had decided that I would not rely on any of the preprogrammed maneuvers but instead would work to develop the hand-eye coordination to fly basic movements myself. I thought that this would make me a better pilot. I needed to learn takeoff, landing, how to move the drone from point A to B, how to ascend and descend, and how to turn.

Training in these skills is well-covered in YouTube videos, so I developed a personal training regimen based on the suggestions and demonstrations in the videos. I worked to establish muscle memory for the three basic drone movements of roll, pitch, and yaw. I would takeoff from one point in the backyard, fly to another point and land, then takeoff again and fly back to the starting point. I

practiced going back and forth, up and down, side to side, turning left and right, and tried to develop a coordinated sense of control when using the two joysticks on the flight controller simultaneously. This is not as easy as it sounds.

One advantage of the drone's flight control interface is that if you stop all control inputs (i.e., just let go of both joysticks on the controller), the drone will stop and hover wherever it is located. It uses GPS and a built-in inertial guidance system to maintain its position: it stays perfectly still. This feature allows you to take a break and recover your situational awareness!

It is important to fly slowly. I set the speed range on my drone to its slowest possible setting. The drone can fly at more than 30 km/h, and at speeds like that things can go bad very quickly. I recommend low speeds for all new pilots like me.

While flying I also had to be very careful to avoid the several wire antennas in the yard, our vehicles, and the house itself. I avoided a few crashes in the nick of time. It was slow going but I started to figure things out.

In parallel, while flying I worked to develop a good understanding of the smartphone app's user interface. There are many camera options, settings, screen displays and warnings that can appear during flight, so it is important to understand what the app is telling you. The quality YouTube videos provided lots of advice.

Once I felt basically competent and unlikely to lose control of the drone, I headed out to a local unrestricted area and very cautiously put the drone into a series of maneuvers while recording video of the ground below. Laura VE7LPM acted as my spotter. I got some good shots of a river and log booms that were lined up along its shore. See Figure 4. These were not of “cinematic” quality, but short sections of the video turned out well, and the test flights taught me the importance of flying and maneuvering the aircraft smoothly.



Figure 4 – Log Booms

The drone’s HD video camera is on a gimbal and needs to be moved up and down in parallel with using the flight controls to keep the subject or subject area in view using a “jog wheel” on the controller. This adds an additional “degree of freedom” to the flight control equation: keeping the camera smoothly pointed while simultaneously flying was challenging.

Skills like these will improve with use and further practise, so while I still consider myself a rank amateur, I will get better at it with experience. The main thing was that I was having fun and learning!

### Safety

Light drones must operate under VFR (Visual Flight Rules). You must keep the drone in view at all times and avoid any obstructions [4]. While you can see the drone’s camera view on

the smartphone app, you cannot rely on this alone for safe flight. The camera only sees in one direction! If the drone is turning or backing up, without being VFR and having an eye on the aircraft it is easy to crash the drone into a building, tree, pole or other obstruction.

There are several videos of drone crashes on YouTube that demonstrate these foolish and totally preventable errors.

It is an extremely good idea (and in fact documented in federal regulations) to have a spotter who works with you when you are flying. The spotter’s job is to keep the drone in sight and warn you of any impending dangers such as obstructions or other risks to the drone. [See 8 and Figure 5].



Figure 5 – Drone Spotter [8]

This is a really good idea. As the pilot, your attention can become focused on the controller and the user interface, and on the live video being telemetered from the drone. This can be difficult because you are trying to fly the aircraft, shoot a nice video, and keep a visual watch the drone simultaneously! A spotter who provides a flight safety crosscheck by keeping the drone in sight at all times reduces your workload.

I am fortunate that Laura VE7LPM, shares my enthusiasm for this new activity and is happy to work as my spotter. Maybe I will be able to get her into piloting the drone herself!

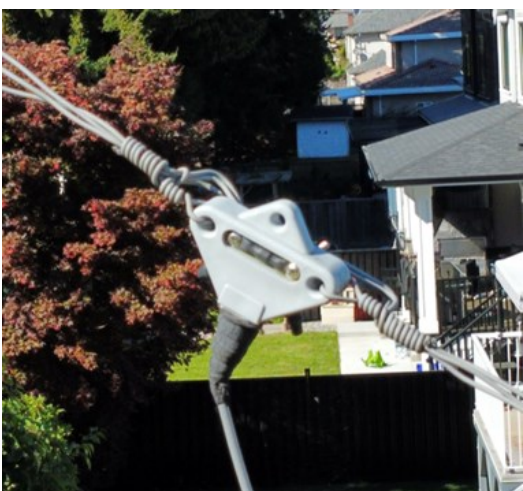




### ***Amateur Radio Applications***

As noted above, there are many useful applications of a light drone in amateur radio. After I had reached basic competence with the drone, I put it to work to inspect my 6m Yagi and other antennas. I got nice closeups of their feedpoints, booms and other components that I can use for future reference. [See Figures 6 and 7].

[Top left] Figure 6 – 6m Yagi Rotator



[Left] Figure 7 – Dipole and Feedpoint

I also used the drone to shoot video of the horizon above our home in Burnaby to get an idea of obstructions that might interfere with (in particular) my VHF and UHF antennas. [See Figure 8]. I shot some photos for a recent “Radio Ramblings” column on 220 MHz antenna experimentation from above the antenna test stand, and they looked pretty good. [See Figure 9].

I continued to practise maneuvers such as circling my 23cm antenna and keeping the antenna centred as the drone travels around the circumference. This is a hard maneuver to learn. It was more “practise” than “practicality”, but it still generated a video that was nice and smooth in parts.

Figure 8 – Obstruction Detection from Home

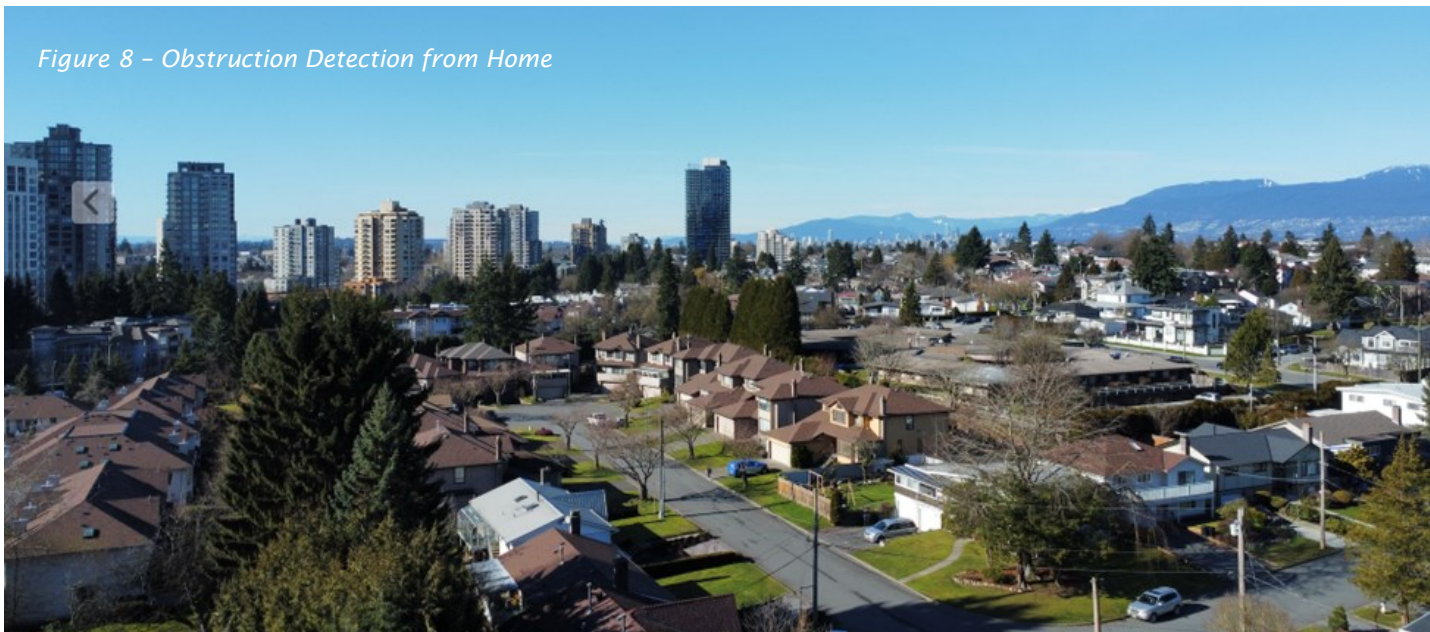






Figure 9 – Test of 220 MHz Antenna

I also attended a couple of SARC events in Surrey and used the drone to shoot aerial shots of the station and location setups. Some photos are in Figures 10 and 11.

In all cases the drone performed well. I have not had any technical problems with it, any issues with battery life, nor mishaps. I have not run the battery down low enough to generate an automatic “return to home”, but I would like to see this emergency procedure in action. I may take the aircraft out to a wide-open field and let the battery deplete in a safe environment so I can see how the drone’s firmware handles the situation.

I have not yet tried holding a very thin wire aloft as a vertical antenna for 80 or 160m, but this is in the plan. The payload capability of light drones is not great, and a hanging wire below the drone represents a flight risk: should the drone lose altitude unexpectedly (due to, for example, a wind gust or an onboard GPS error) then the wire could snag on the propellers and the drone could crash.

It will be a good idea to buy a “payload hold and release” remote control drone accessory see [Figure 12] that will allow the wire to be jettisoned if necessary. This is one of several low-cost after-market options available for my drone.

One thing to note here, however, is that it is important to keep the light drone’s weight under 250 grams at all times. Light drones have very low payload capacity. A 240-gram drone with 20 grams of payload would put the aircraft overweight for its class (260 grams) and represent a violation of federal aviation regulations.



Figure 10 – Portable 23cm EME Demo on Field Day



Figure 11 – Cruise-In Event

You would then need a license to fly the drone, be flying without a filed flight plan, and have failed to notify ATC. Federal aviation authorities take these rules seriously, so you need to ensure that all your flights keep you in the “light drone” category.

### Purchase Options and Cost

Now to the important questions of drone makes, models and cost. For any new drone pilot, I would recommend an aircraft in the light drone (under 250 grams) class, as



Figure 12 – Payload Hold and Release Device [9]

neither you nor the drone will require licensing and you can fly in uncontrolled airspace without having to notify ATC. You will be able to gain valuable piloting experience before potentially upgrading to a heavier, more capable (and consequently, more potentially dangerous) registered and licensed drone.

Light drones are reliable and capable aircraft. The aerial shots in many recent movies and television programs have been shot using light drones, so do not discount their flying or cinematic capabilities. A great example is referenced in [10]. Get some experience with a light drone - then if you feel you need more payload or flight capability, you can upgrade.

A highly functional light drone like the one I have described in this column will cost about C\$600. Considering its capabilities and the cost of drones in the past, I consider this affordable. However, I would highly recommend purchasing extra batteries, a charging unit, a spare set of propellers and other accessories at the same time as you purchase your drone. It makes flying more flexible and convenient. With approximately 30 minutes of flying time per battery it pays to have a couple of extra batteries available. These accessories add about C\$200 to the price.

There are many drone manufacturers, but the market is dominated by two companies (DJI and Autel, [see 11] who have both worked very hard to integrate leading edge electronics, GPS,

smartphone technologies, SDR and Internet connectivity to make their drones (relatively) easy and safe to fly. There are several other popular manufacturers and drone

enthusiasts publish annual reviews. See TechRadar's latest review at [12].

My drone package (which includes the drone, extra batteries, a charging unit and spare propellers) is currently available on Amazon for C\$729. Search for "DJI Mini 2 Fly More Combo" on [amazon.ca](https://www.amazon.ca).

### Conclusion

Light drones are fun and can be helpful to amateur radio activities in both a technical and operational role. In my case, I am learning a new skill and really enjoying the ability to view things from a new aerial perspective. I hope to continue to use my drone to augment my personal amateur radio operation, and to support SARC and SEPAR events.

Safe drone flying is predicated on responsible operation and responsible pilots. Proper training, safety and awareness of aviation regulations are important to safe flight for yourself, and more importantly for others who use Canadian airspace. It is also important to respect privacy laws when you are flying and not intrude upon other peoples' personal space.

Light drones leverage leading edge technologies and are relatively easy to fly. By staying in the "under 250 grams" category you can avoid licensing requirements, but this does not mean that you can fly with disregard of aviation regulations or municipal bylaws. Be safe, and be considerate of others!

Feedback on this article can be directed to the Editor, or directly to me at [mcquiggi@sfu.ca](mailto:mcquiggi@sfu.ca). Thanks for reading!

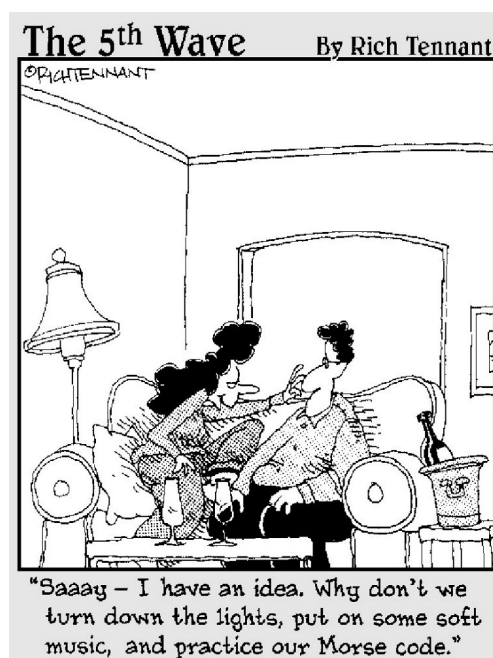
73,

~ Kevin VE7ZD / KN7Q



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  - [12] <https://www.techradar.com/news/best-drones>
- And of course the SEPAR Mobile Cruise-In video <https://bit.ly/Cruise-In22>







*Peter Vogel VE7AFV*

## *Preparing for CMEs, or not*



CME: an abbreviation that has become known to those who long to see auroral activity - the northern lights, aurora borealis (or its southern equivalent, aurora australis). A CME, or coronal mass ejection, is basically a solar hiccup that hurls mass from the sun in unpredictable directions.

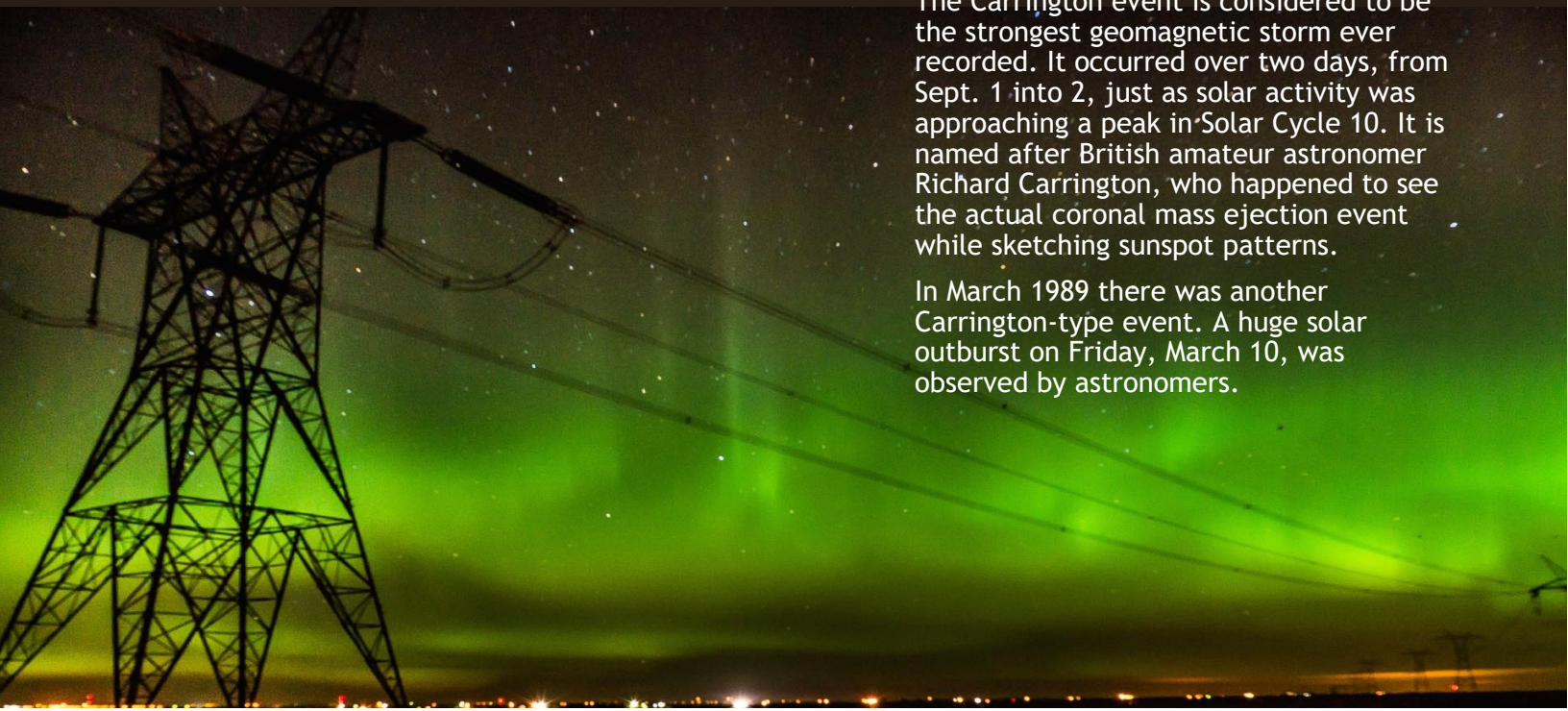
When a given CME occurs in the direction of Earth, various websites go into overdrive and observers get ready, hoping to see one of the marvels of nature, a light show like no other. Vancouver puts on some spectacular fireworks events with the summertime Celebration of Light, but these have nothing on an auroral light show.

However, there is more to CME events than mere spectacle. A large enough CME could wreak havoc in worldwide communications networks, particularly those involving satellites. Even worse, it could bring down electrical energy distribution systems.

For decades now there have been calls to “harden” such electrical systems, to limit the negative effects of a CME event, if not outright prevent them. We’ve had some experience with big CMEs. In 1859, the so-called Carrington event, admittedly before the age of widespread electrification, caused widespread damage. During this event telegraph key operators reported long sparks leaping from their keys, and some telegraph stations burned down.

The Carrington event is considered to be the strongest geomagnetic storm ever recorded. It occurred over two days, from Sept. 1 into 2, just as solar activity was approaching a peak in Solar Cycle 10. It is named after British amateur astronomer Richard Carrington, who happened to see the actual coronal mass ejection event while sketching sunspot patterns.

In March 1989 there was another Carrington-type event. A huge solar outburst on Friday, March 10, was observed by astronomers.



On Sunday March 12, in the evening, the plasma cloud from this CME began striking the earth, and just before 3 a.m., the Quebec electrical grid failed. The province was without electricity for some 12 hours. Ripple effects caused grids elsewhere, deep into the United States, to go down as well.

Meanwhile, the northern lights put on a spectacular show, only enhanced by the darkness in cities. Auroral activity appeared as far south as Cuba and Florida, another indication that this was a particularly big solar event.

Try to imagine all of Metro Vancouver, or even the entire province, plunged into darkness, nothing electrical working. Transportation would grind to a halt. Communications would rapidly begin to fail as backup power sources begin to diminish in capacity.

Today, in 2022, we are in Solar Cycle 25, that is to say the 25th such cycle since records, particularly of sunspot numbers and solar activity, began to be kept in 1755. Cycles are around 11 years in duration and Cycle 25 began in December 2019.

For the current cycle then we are still a few years away from a peak in solar activity, but an increase in CMEs is already noticeable through enhanced auroral activity that reaches down to and even beyond the 49th parallel.

Pretty much every week or two I'm asked through my social media channels about a possibility for northern lights being visible from Vancouver. Up until this point my replies have always been laced with doubt. Northern lights sightings in Metro Vancouver are relatively rare. The odds are better in very dark spots such as near Pitt Lake, or, outside the Metro area in, say, Porteau Cove off the Sea to Sky Highway.

Northern lights and beautiful auroral activity aside, a real concern is a repeat of a Carrington-class event. There have indeed been some but, fortunately, they weren't directed towards earth. Such an event today could cause damage that might take months or even years to repair. Damage estimates ranging into the trillions of dollars for North America alone have been bandied about.

We have a much better understanding of the sun today than we did when Richard Carrington saw the solar flare that hit the earth a day or two later. We can even issue warnings, and certain sensitive spacecraft can be directed away from greatest impact orientations.

But not much has actually been done to harden our terrestrial electrical and communications systems. Governments and regulatory agencies have been slow to take up this file. In the current geopolitical instability we may have another reason to take action: the deployment of a terrestrial equivalent of a CME, an EMP device. Electromagnetic pulse weapons, whether nuclear or otherwise, are designed to disable communications and electrical distribution systems over a wide area.

We know rather little about EMP weapons, which is perhaps a topic for another day. For now, I will keep tabs on solar events, consult my favourite space weather sites, and hope for a non-damaging CME that lights up Metro Vancouver skies with dancing auroral displays.

~ Peter VE7AFV

*Peter is very active on Facebook and Twitter sharing his amateur radio SDR and satellite experiences from his home in Port Coquitlam, BC.*



# separ Mobile Cruise-In

We asked you to show off your ‘perfect’ radio installation

John Schouten VE7TI

The first Surrey Emergency Program Amateur Radio (SEPAR) ‘Mobile Cruise-In’ took place on August 14, 2022. As far as we could determine in planning, it was the first such event in Canada. The idea originated from an article that I spotted in ‘The Radiogram’ newsletter of the [Portage County \(Ohio\) Amateur Radio Service](#). Curious about the purpose of the event I emailed the PortCARS contact. I received a reply almost immediately with details about the history and past success of their Mobile Cruise-In. They have been doing the event for twelve years previously in conjunction with their local A&W restaurant. Their turnout has varied with the weather, but in past years they’ve had 50 or more entries. In addition to the entrants, they welcome members of the public to stop by and check out the goings on. They say that it’s a great way to generate some exposure for Amateur Radio and for their emergency programs.



The goal is to encourage the building of good mobile installations and ‘Grab ‘n Go’ kits, and to give local hams an opportunity to

display them in a social setting. It also provides an opportunity to let those attending learn what works, and what does not, which is invaluable money-saving information particularly for those new to the hobby. Like SEPAR, PortCARS is involved in their local emergency preparedness program and the availability and proper operation of mobile and other portable stations is considered a key component of their readiness to respond.

Two factors were key in my planning of our Surrey event. Number one is the sometimes-unpredictable west coast weather. I was keen to have the event in a summer month but I purposely avoided the end of August. This is the time for our local 2-week Pacific National Exhibition (PNE) which often seems to have a rainy start. Secondly there was doubt whether the event would be well attended. ‘First-of’ events can be tricky anyway and this one has a limited interest group. SEPAR has not been particularly active recently due mostly to COVID restrictions. In the past we have done school visits, public library presentations and other public events geared to promoting better understanding of emergency communications. SEPAR is closely allied with the Surrey Amateur Radio Communications ([SARC](#)) Society which



provides financial, hardware and technical support, and access to several local repeaters on 2m, 1.2m and 70cm bands. The two groups also collaborate on a very successful quarterly on-line [Basic certification course](#), Field Day workshops and numerous contests from a 3-position training centre co-located with our Search and Rescue Society.

Sunday, August 14, 2022 from 2 to 4 PM was agreed upon and, following the success of the Ohio group, we asked the A&W restaurant chain to support the event and to provide access to their parking lot, which had to be large enough to accommodate the vehicles and pedestrian traffic. In return they would receive positive community exposure and likely see an increase in business. The national office of A&W indicated that local sponsorships are up to the individual franchisees, so I first selected a store in a busy area located in a central part of our city. Despite several emails and an in-person visit, no response was received. One of our members works part-time at an A&W in a neighbouring municipality. In conversation he said that the franchisee he worked for had five restaurants in the area and that one was particularly well suited with a large parking lot and several other fast-food restaurants in the same complex. In subsequent contact we were offered the location [\[map\]](#) on any Sunday of our choosing.

Following the successful example of the PortCARS group we chose to judge entrants for two main prizes, the best mobile installation, based on neatness, safety and good electrical and RF practices and secondly to award a prize for bands and modes covered. I contacted various organizations and businesses to canvas prize donations. Local dealers stepped forward as did Radio Amateurs of Canada, and we are thankful for their support. Unfortunately, none of the major manufacturers chose to participate. In

addition, we had several smaller prizes available.

We did not want to have the event judged solely by hams. Sure, we know a good installation, but we thought it important to include our emergency preparedness partners as independent judges and to witness the ingenuity and resourcefulness of hams to prove that we could deliver communications when commercial providers could not. The recent Canada-wide Rogers Mobility outage was mentioned more than once as a reason Amateur Radio communication remains an important resource. Our civic emergency plan is under the direction of the Surrey Fire Service. In recent years we have formed an excellent relationship that has resulted in access to training space and contribution of many Amateur Radio volunteer hours, more than any other public component of the emergency plan.

We therefore asked Assistant Deputy Fire Chief Shelley Morris to be one of the judges. Surrey is the largest Royal Canadian Mounted Police (RCMP) jurisdiction in Canada but is currently in a policing transition to a municipal police service. We have graduated several police members from our Basic course, so I asked one of them, Cpl. Dan Klassen VA7DDN to be our second judge. Dan brought along Cst. Adam McBride, who works in

#### SURREY EMERGENCY PROGRAM AMATEUR RADIO

## Mobile Cruise-In

Show Off Your 'Perfect' Radio Installation

Sunday, August 14, 2022—2 to 4 PM

A&W Restaurant Parking Lot, 2725 192 Street, Surrey, BC

Your Grab 'n Go Kit, Vehicle, Equestrian, Marine, Pedestrian, or ?



So you think that you have one of the best amateur radio mobile radio installations or grab 'n go kits to be found? Ready for any emergency call? Here's your opportunity to show off that great mobile station or kit and compare it to others... VHF, UHF, HF or ?

- Get some ideas for your own kit or vehicle
- Find out what works for others (and what doesn't)
- Prizes for the neatest installation and most bands covered

Advice for proper wiring of mobile gear will be provided

Enjoy a fun afternoon with your fellow hams over an A&W root beer and their great food and beverage menu



emergency planning. SEPAR Coordinator, Gord Kirk VA7GK, agreed to guide the judges, provide technical details, and answer any questions.

In the weeks leading up to the event I asked several of our members who frequent local nets to spread word of the Mobile Cruise-In. I posted on our [Facebook](#) and [Twitter](#) accounts, both within and outside the ham community, and reaction was very positive with remarks such as: “Why hasn’t someone done this before” and: “I wish I could come but I live too far away”. In the week before the event I sent

out an email to our membership and students from the previous six classes. The message read as follows:

*Many Amateur Radio licensees have home stations where the hobby is practiced for fun, contacting similar stations all over*

*[Top] One of three SEPAR Grab ‘n Go kits constructed in 2009.*

*[Middle] Surrey Assistant Deputy Fire Chief Shelley Morris, Gord Kirk VA7GK, RCMP Cst. Adam McBride, Cpl. Dan Klassen, and John Schouten VE7TI*

*[Below] RAC 2021 Amateur of the Year Hiroshi Takahashi, VA7LET and his mini fire truck.*

*the globe, but the hobby has a serious side as well. We provide emergency communications where all other systems, such as cell phones or even radio towers fail. Many of us have mobile stations that permit us to operate wherever and whenever. Mobile Amateur Radio is not restricted to cars and trucks but bicycles, even pedestrians and equestrians. This type of broad-based community availability requires no commercial infrastructure, hence the slogan: “Amateur Radio works when all else fails”. This has been shown time and again all over the world. SEPAR would like to host a first-ever event of its kind locally. Prizes will be awarded for the neatest installation and bands/modes covered. So, polish up your mobile rig, dust off your Grab ‘n Go kit and come show it off at the ‘Cruise-In’*

From these efforts and feedback received, we felt confident that there was interest in the event.

Sunday, August 22<sup>nd</sup> was a sunny warm day... concern #1 looked after.

We arrived at the location shortly after noon. SEPAR has a communications trailer, and it was deployed in the A&W parking lot, along with tables and a canopy. The Surrey Fire Service paid for the construction of three identical Grab ‘n Go kits in 2009, and one was set-up as a demonstration station. TCA published an article about them in the May/June ‘The Canadian Amateur’ magazine that year. The article was also published in the April 2010 ARRL QST.

Constructed under the direction of John Brodie VA7XB, these kits are fully equipped for HF, VHF and UHF bands plus packet, and each has power supplies, a laptop computer and a handheld radio with charger. A secondary kit carries rope, antennas, charging cables and various other gear that might be required in a field deployment.





Shortly after we completed our set-up, the Surrey Fire Service Community Program Van arrived and deployed beside us. The volunteer staffing their display, provided information on fire safety programs and our Neighborhood Emergency Preparedness Program (NEPP), for which SEPAR volunteers provide communications support. NEPP groups are encouraged to have a plan to use any available radio communications gear including FRS, GMRS, CB or Amateur Radio to contact their designated neighbourhood SEPAR station which can then handle traffic to and from the SEPAR communications centre, which is in contact with the City Emergency Operations Centre.

By the scheduled start time of 2PM the parking lot was filling with ham license plates and many other vehicles, most of which bore antennas. We did not require pre-registration, but Paulette VE7VPE signed in those who indicated they wanted to have their kit reviewed by our panel. They included not only cars and trucks but also two bicycle-mobiles and a pedestrian-mobile kit. Most striking was a mini-fire truck brought by Hiroshi VA7LET. He imported it from Japan and is in the process of outfitting it as a mobile station.

Shortly before 3PM the judges toured the 29 entries that had signed up. They covered the spectrum of the hobby, from simple single-band transceivers to complex built-in installations. They took a genuine interest in the various installations, often having a very close look and asking questions. All remarked on the ingenuity of the kits and realized, if not before, that these stations are indeed useful in an emergency. Each entrant was asked to describe their station, its capabilities and occasionally the cost. Several kits had digital capability, whether through APRS, Winlink or brand-specific proprietary modes such as D-STAR.

[Top] A pre-judging drone view of a section of the A&W parking lot.

[Next two photos] Judging in progress.

[Bottom] SEPAR Coordinator Gord Kirk VA7GK demonstrates one of the three SEPAR VHF/UHF and HF [grab 'n go kits](#). These kits are fully self contained and include a TNC for digital operation.

Built by a team of SARC and SEPAR volunteers in 2009, the Surrey Fire Service paid for the components in the kit. TCA published an article about them in the May/June 'The Canadian Amateur' magazine that year. The article was also published in the April 2010 ARRL QST.







[Top two photos] Entry judging.

[Above] Fred VE7MPI demonstrates his self-contained backpack mobile, and [right] Andrew VA7LGN shows his newly assembled, and very compact 'Go' bag.

### Some of the notable entries

**Stewart VE7SZB** explained how he removed the entire dash from his late-model truck to install the body of his multi-band transceiver and installed the head unit out of sight in the console, an installation that got the approval of the police judges as a theft deterrent.

As shown on The Communicator cover, SARC Vice-President **John Brodie VA7XB** displayed his recently completed 'Go' kit. John explained that the construction style of his kit is similar to the original SEPAR units built in 2008, with the significant difference that this one is VHF/UHF only. The robust carrying case was purchased at a swap meet and the components designed to fit inside.

The equipment (including computer) can operate either from external sources or from battery, made possible with a Samlex 300w pure sine wave inverter. A Tigertronics USB Signalink soundcard is the interface for packet digital signals from the Winlink Express/UZ7HO Soundmodem software and the Yaesu FTM-400XDR radio.

The radio is also capable of both digital voice (C4FM) and standard FM communication. Additional USB ports were installed for cell phone charging and the like. A digital voltmeter displayed battery voltage.

**Andrew VA7LGN**, a recent graduate of our Basic course, brought a compact 'Go' bag. He said that the bag started out as an emergency net control station kit that can be taken with you in a car, or kept available in case an emergency takes you out of the house. It includes a roll-up J-pole, 25 feet of coax and enough rope to hoist it into a tree or other elevated position, which provides for excellent signal with a VHF/UHF mobile radio, or when used with the HTs that he keeps in the bag. As for the included radios, he has two dual-band handhelds, one attached to a 46" Abbree folding "tactical" whip antenna, and another with built-in APRS capability using a shorter folding whip. For the radios he's included spare batteries - of note the Jianpai 8800 radio includes USB-C on the batteries for field charging.





The kit includes a log book, local repeater frequency list, and topographical maps of our local area. The bag includes a stand alone GPS, binoculars, a sighting compass (for taking bearings on things like buildings, smoke, or to set up a directional antenna), and flagging tape - all items that can be useful when setting up an emergency station, especially if access to power and cell service is limited or unavailable. For utility Andrew also included a multitool and folding knife which, he suggested, no go-bag should be without.

**Stan VA7NF** brought a Grab & Go kit for high end HF contesting; a single transceiver. His Flex 6300 SDR was set up in the rear of his SUV and covered bands from 2m to 80m, although absence of a low-band antenna prevented a demonstration of its full capability.

Stan described it as follows: *[photo bottom right]* The case is a Gator hard plastic with 4U rack mounting and latch on removable front and rear covers, providing space for wires, connectors, and misc. supplies. The covers must be removed for access and ventilation.

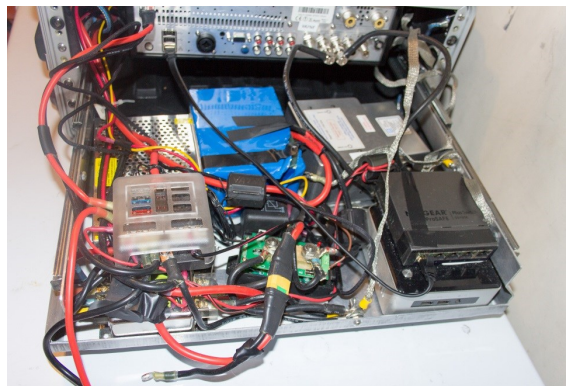
The top 2U has a FlexRadio 6700 with rack ears covering all bands 2200M through 2M with 100W on most bands. Because it is a Flex SDR, it can display eight concurrent receivers on 2 concurrent antennas. One transmitter can be active on one of those bands.

The bottom 2U has a custom-built pull-out tray with prototype front panel. There are two filters connected to the Flex antenna 'A' out/in loop, a front end overload protector, and broadcast band reject filter. On the bottom right, an eight-port Netgear 12V 1Gb switch above and Intel NUC 14V computer below.

The centre top has a 13V 20Ah Lithium phosphate battery, and the centre middle a 200A battery switching relay with a front panel push button. There is also a metering sensor for the front panel 12V monitor, a 14.6V 30A fan less power supply, power distribution and fusing, and a 12V EMI filter, an auxiliary power takeoff for 100Ah shack power and battery, 120V AC with switch, fuse, and AC EMI filter, relays for 12V Maestro power and auxiliary power which also serves as a mobile car battery/solar source connection.

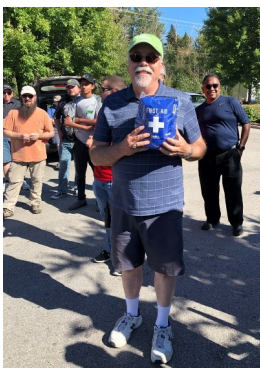
Stan says that the XT90 battery connectors are preferred as they are smaller and handle higher current. Powerpoles are only used connecting to the Flex and on the front panel for external connections.

As the FlexRadio is a radio server, it may use many interface devices. This usage is for either or both a Maestro control panel with front panel 12V power and network cat-6+ connections or a networked computer.



*[Top] Gord VA7GK provides a briefing for the judges.*

*[Below] Stan VA7NF and his Flex 6300  
[Below left] The rear and inner workings of Stan VA7NF's Flex kit.*



Two of our winners with emergency kits donated by the Surrey Fire Service.

We thank our gift donors:

- [The Surrey Fire Service](#)
- [Radio Amateurs of Canada](#)
- [Fleetwood Digital Products](#)
- [Burnaby Radio](#)
- [SARC](#)
- [LoveltLocal.ca](#)
- Gord Kirk
- John Schouten

Normal usage is as a fast connect 3rd operator contesting station with a large display for radio and N1MM. Phone is supported but, as a CW only operator, Stan uses external mic/preamp/XLR cabling. The AC power was once not connected and the kit ran for eight hours of contesting with 40W output before being noticed.

Stan says he still has work to do to perfect his kit, including resolving some 14V switching EMI (about 52 spikes on 160M), and also converting the front panel Powerpoles to XT90 and XT60 with perhaps one remaining for connectivity.

**Trevor VE7BM** brought his 'Parks on the Air' HF set-up and rigged an impressive 40-foot fiberglass spider pole suspending a wire antenna connected to his IC-718.

**Steve VE7SXM** had a unique mobile set-up that caught the judges attention because it was easily transferable between vehicles.

**Fred VE7MPI** brought along the only backpack mobile installation of the event. The very portable set-up included a 30 Watt solar panel.

**Ron VA7CPL** had APRS, and CB radio in addition to his ham gear.

**Paul VE7ZZT** had a neatly installed dual-band rig, FRS, GPS and added safety equipment including a fire extinguisher.

**Hiroshi VA7LET** and his unusual vehicle, the mini fire rig, was certainly the most eye-catching entry. His 'work in-progress' included dual-band V/U and HF with a Tiny-Tracker for APRS use.

**Paul VA7VP** Had a truck with tri-band radio plus a handheld in the cup holder.

**Don VE7FW** brought his Grab 'n Go kit with an Icom 705 in a camera bag, and a solar panel.

**Ron VE7VTA** set up an easy-up canopy and had a table with a dual-band transceiver that offered phone, and Winlink capability. Power was supplied by a generator and solar charged battery.

**Hugh VE7YJ's** HF set-up included a screwdriver antenna connected to an FT-991 HF rig. Both were powered by a separate battery.

There were two bicycle entries. **Peter VE7QRZ** had a kilowatt of battery power at his disposal thanks to his electric ride. The radio was on a chest pack.

There were a number of other entries, primarily of handheld transceivers and mobiles. We thank all those who entered and those that came out for an interesting day of ham talk.

Judging wrapped up just prior to 4PM but had taken longer than initially anticipated. I think that this was a result of the panel's genuine interest in each station and participant... which is not a bad thing! We had about a dozen donated prizes and the winners of each category were permitted to select the prize they wanted. The remaining prizes were drawn at random from the other entrant's registration tickets.

Feedback has been universally positive, and we have already been asked if we intend to repeat the event next year. That decision will rest with the group's directors and will likely not be made until early next year. Personally, I would like to see a site a bit closer to the centre of the city as I believe our location this year was a bit too remote for many hams. That decision will depend on our sponsor and the availability of a large enough parking lot.

The event also brought an unexpected bonus in that we have three new Basic course candidates who were drawn to the event as passers-by or through our social media posts.

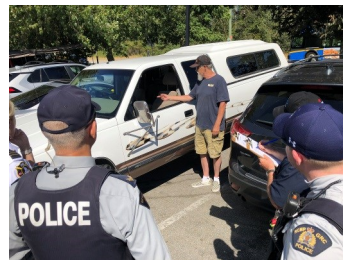
~ John VE7TI

*A video of the Cruise-In is posted on our [YouTube](#) channel*



# separ Mobile Cruise-In

## More Photos







## Thunder Run

Operation Thunder Run or the 2022 Thunder Run Airlift Emergency Response Operations was an emergency preparedness exercise that took place on June 18, 2022.

This exercise was a collaborative effort by aviators from Whatcom County, Oregon and Cal DART, (Disaster Airlift Response Teams), BCAERO, (British Columbia Airlift Emergency Response Operations), as well as HAM operators on both sides of the international border. As well many other supporting organizations.

This is the first time Canadian flyers and HAMS participated in this operation. This all stems out of the recent BC disaster last November when the province suffered tremendous damage from

the 'atmospheric river' that dumped many 100's of millimeter of rain. Many major roads were washed out. Rescues were made by Canadian military members etc.

It became very apparent that a civil response system was needed. For this many private flyers offered their services to transport supplies to many BC towns and villages cut off due to washed out roads. Many services were interrupted. In the November disaster flyers from Langley transported over 30000 pounds of goods all over the southern interior.

Out of all this the Westcoast Flying Club at Langley under Shawn Heaps came up with BCAERO. Contacts were made with members of DART in Washington and we were invited to join this exercise.

I myself as a private pilot made a few trips carrying food to Merritt in the southern interior. I am as well an active HAM operator, VE7GPR, it soon became very apparent the role HAM operations can be in such situations. I was contacted by Sigmund Sort, another pilot who asked if I was interested in handling HAM operations out of Langley Airport for this exercise. I was joined by Austin Hallett VE7QH, and Oswald Kienapfel, VE7OK. The HAM team in the US was headed up by Dee Williamson, KE7CFM, DART ARES.



Many HAMS in the US were involved with this operation. As such along with voice communications 'WinLink' email was employed as our main coordinating system. WinLink was used wherever possible over HF/VHF/UHF. Preorganized forms on WinLink were used to communicate weather, logging and road conditions etc. Primary information was actually gleaned for the 'Subject Line: 'of the WinLink messages. In my situation aircraft movements and such. All this information was managed by Dee in Washington state. Voice com over HF/VHF/UHF was also employed, with WinLink being the priority.

My setup at the Westcoast hangar at Langley Airport employed the following; a home brew emergency power supply which included a 50AH LiFe battery, USB power and Solar charger. Also, I built a 5 element 70CM YAGI with a quad reflector and driven elements to contact an American repeater located about 35 NM south near Mt Vernon WA; N7CRA. This antenna was connected to an Anytone AT779. I also had a Kenwood VHF as well as a cheap HH to communicate with Austin Hallett VE7QH at Abbotsford airport. A VHF com antenna was also placed on the hangar roof.

Finishing off the comm gear I had a Laptop and HH with a 'Mobilinkd 3' dedicated to communicating with a nearby WinLink RMS repeater, I also with Internet backup for the Winlink connection. We learned a great deal on communications, for example Austin and I had to rely of a repeater located in the Abbotsford area, as simplex was poor between our two sites. Also, I found even with the YAGI pointing as best to the UHF repeater I had poor results contacting the Washington group. However, WinLink being the primary communication mode with voice being secondary we had little issue with this.

We had over 15 aircraft flying a 'round robin' between Langley BC, Bellingham WA, Abbotsford. The two Canadian airports were needed due to customs requirements. Now I should mention that special arrangements were made with customs and such to make

quicker turn around times possible for the flyers between Washington and BC. Austin and his group from the Chilliwack Amateur Radio Club were setup at Abbotsford to receive inbound aircraft, and pass along to myself at Langley. I then would discharge aircraft to Bellingham.

Donated food was provided for this exercise to test a real situation. Aircraft were loaded by ground crews where weights and balance were carefully checked based of aircraft. Ultimately this food was distributed to many food banks on both sides of the border.

This first foray for me into actual emergency response was both enjoyable and a huge learning experience.

Further info here;

<https://www.youtube.com/watch?v=2SL51cfQU1U>

~ Gary Peare VE7GPR







John Schouten VE7TI

## ***A rebuild of the MFJ-557 code practice oscillator***

Like many others I have owned an MFJ-557 code practice oscillator for many years. I originally purchased mine at a ham swap meet for a not unreasonable price of US\$ 15. I note that they are now listed at US\$ 74.95 on the [MFJ](#) website. I already had my CW endorsement when I purchased this unit but having grandkids, who I hope will join the hobby, I thought it a sound future investment. They are now old enough to start using the oscillator but when they did, I found myself aggravated by the rough, raspy audio. The reason for this of course is that MFJ uses an inexpensive 555 timer chip to produce a square wave. If the oscillator produced a pure sine wave the tone would be much smoother and much less annoying.

Secondly, the key is one that I used to purchase from a local electronics store for about a dollar many years ago. It is prone to corrosion of the contact points which makes the unit even more unpredictable.

We have found that sliding a piece of paper while holding the contacts almost closed cleans them sufficiently, at least for a short time, so that the sound is less annoying. It's a sign of the times that manufacturers save pennies where they can however, at the low cost of components, and the high cost that this unit is currently selling for, one would think that those few extra pennies might pay off in better reviews and increased sales.

I often turn to [eHam.net](#) for their excellent and generally unbiased user reviews. The MFJ-557 has been reviewed several times. It rates only two out of five stars. Generally, the reviews are best summarised by Michael VE7MXL who wrote:

*“First, you need to change the pitch of the oscillator. Replace R2 with a 10K resistor to change the tone range to be 600 Hz to 1000 Hz. It ships with a 4.7K, IIRC, which makes the tone range way too high. Go with an even bigger resistor for a lower range.*



*Second, you need to filter it to avoid listening fatigue from the truly horrific distorted sawtooth output waveform. A single-stage W7ZOI filter with follower input and (possibly) follower output will be enough to get you a sine wave into headphones. This is a pain, but an audio CW filter is usable with a radio after you've learned CW so it's not a waste.*

*Another alternative is to replace the oscillator, but the best choice at several hundred Hz is a Wein bridge, which is notorious for settling in to the tuned frequency. Or, one could use the brain dead MFJ circuit and augment it with a single-stage W7ZOI between the 555 and the audio amp (LM386, I think).*

*Maybe you could replace the LM386 with a multi-stage peaked low-pass filter, which would eliminate the ability to adjust the output frequency in exchange for a much better tone, even mostly fixing the frequency variability by filtering out the early wrong-frequency rise time.*

*Anyway, you should make yourself comfortable with the idea that the purchase price gets you a project box and a key (maybe some components can be re-used). The oscillator itself had to have been designed by someone who hates hams. You will either fix it or abandon the device."*

Other reviews all mention the same issues. While Michael's fixes no doubt improve the quality of this oscillator, I thought there must be a better way to just start from scratch.

It has taken several CW instruction courses put on by our Surrey Amateur Radio Communications group to prompt me to investigate creating practice oscillators that were better suited for the purpose and that produced a better tone. SARC/SEPAR own four of these MFJ units. I researched dozens of circuits with various configurations, quality and cost. Some

excellent ones, submitted by Daniel Romila VE7LCG, were published in The Communicator several years ago. Earlier this year I came across a project by Mike Maynard K4ICY. Called '[The Pleasant Code Practice Oscillator](http://www.k4icy.com/weekend_radio_3tr-audio-amp.html)', it met all the criteria I was looking for. While not mentioned in the article, I carefully measured, and discovered that the circuit board would fit perfectly inside the MFJ case. Links to Mike's project, and the subsequent version 2 revisions by Steve Smith G0TDJ are at URL [http://www.k4icy.com/weekend\\_radio\\_3tr-audio-amp.html](http://www.k4icy.com/weekend_radio_3tr-audio-amp.html)

I called on my long-time friend and former work colleague Kevin McQuiggin VE7ZD/KN7Q for his opinion. Kevin has instructed our CW courses and is an avid experimenter and ham, as you have surely noticed in his previous 'Radio Ramblings' Communicator articles. He also has lots of circuit board design experience. Kevin had similar concerns about the MFJ oscillator and was quick to enlist with this project. We decided that this would be a good upgrade for our existing MFJ oscillators and that we could offer this to our CW classes as a separate SARC/SEPAR workshop project at a cost far less than students buying their own.

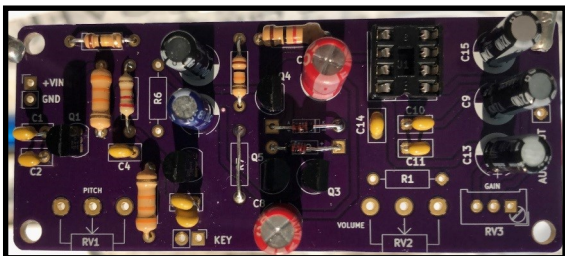
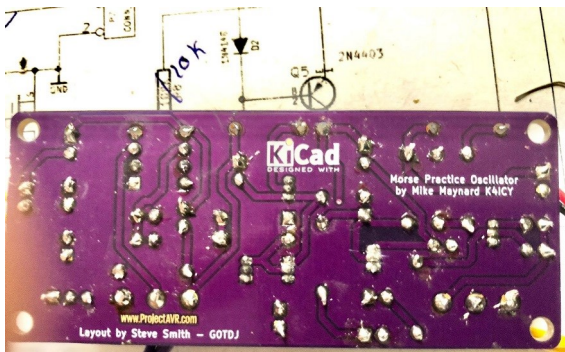
Kevin ordered the boards from a non-profit supplier he has used previously, [OSH Park](#) in Portland, OR. The various components were purchased locally and from [Digi-Key](#). The boards arrived quickly, as did the parts. Kevin had some issues locating the following:

- a small, quality speaker
- suitable potentiometers for volume and tone

Kevin built the initial board based on the version 2 design. He found that the volume was lacking and that some adjustment to the tone was needed. A change to resistor R<sub>8</sub> and a wire to replace R<sub>7</sub> was necessary to increase volume. The other issue that

was immediately discovered was that we could not purchase a competitively priced speaker with sufficient quality to produce the tone desired. Most people have external speakers or headsets of their own and would probably prefer to use that to prevent annoying those around them with their CW practice. So we decided to make the project less expensive for our members and build in an earphone jack rather than a speaker. Of course, the MFJ already has a small speaker and that would be left connected, despite its sub-par sound quality.

Various stages of the build



I built the second board incorporating the design changes from the first.

Kevin kindly offered to solder in the transistors because of their very close spacing and his access to a proper soldering station. Kevin brought me the parts kit and I set to work to complete the board. An hour or two later I was ready to test. I could not get a tone! Then followed another hour of signal tracing and checking for solder bridges or misplaced parts. Simultaneously there was a series of messages between Kevin and I to determine what the problem might be. I believed that the signal ended at the audio amplifier IC and Kevin was going to provide me with a replacement when I

next saw him at that week's CW class. Replacing the IC solved the issue but there was still some work to do with the audio volume on my board, and adjusting resistance values eventually sorted out that problem.

My next step was to remove the innards from the MFJ and fit our project into the case, while preserving enough space for the 9-volt battery. My measurements turned out to be accurate and the board fit precisely into the cavity of the MFJ. I chose to add an external 3.5mm key jack on my own oscillator. I had already replaced the key and relegated the factory key to the junk box, but I wanted to add the option to use an external key because I own several others and I thought that builders might want to do the same. It was certainly a requirement in my mind that we offer this on our four MFJ oscillators because of the poor quality factory key.

The original potentiometers on the MFJ were split-shaft to accommodate the two knobs for volume and tone. Our replacement potentiometers had longer shafts and were not split. Some work with a hacksaw and drilling out the factory knobs to one-quarter inch resolved that issue. I also trimmed two plastic tabs inside the case to make room for the battery. The battery now fits alongside the long end of the board rather than along the short side. It's a tight fit but it works. There is some room to trim the board slightly along both edges to improve the amount of space in the case.

While I was at it, I decided I would also make an inexpensive key for those in our class who did not own one of their own. I am very surprised





at the increased price of CW keys. There was even a key advertised on [amazon.ca](https://www.amazon.ca) that was identical to the cheap MFJ factory key but mounted on a piece of wood, and with a wooden cabinet knob, and it was advertised at C\$105, a ridiculous price for such a low quality key.

*The C\$ 105 Amazon key*

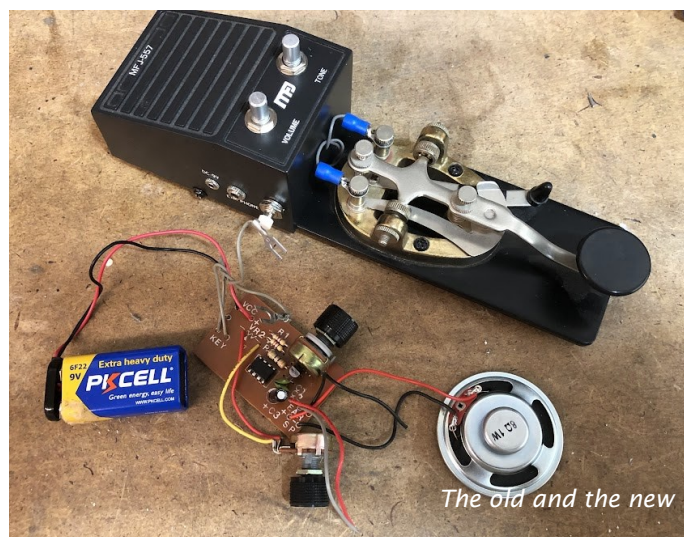
I made mine from a spare piece of circuit board, a C\$ 1 micro switch and some [Home Depot](https://www.homedepot.com) hardware. The hardwood base and brass knob were from my scrap box. Other than my time it cost me less than C\$ 4 to assemble. Most of the experimentation for the right 'feel' was in the length. It had to have just the right amount of tension to spring back. I had several of our contest CW ops try it and it came back with good reviews, and was judged entirely suitable for beginners. Look for the project in the next Communicator.

~ John VE7TI

*The home-built key*



*The new circuit board installed*



*The old and the new*



*The finished oscillator, minus knobs*



...more

# SOLDER SPLATTER

Steve Riddle KM4FLF/VA3FLF

## *A Great Homebrew Vertical Antenna*



Last spring, I was going through my many boxes of ham “stuff” looking for items to sell at our club tail gate sale. I came across a couple of Hustler SM Series Resonators (20 /40 Meters) that I had acquired. I am not sure where I obtained them, but I decided they were keepers. That decision turned out to be the first step in a year long process that has given me an awesome homebrew vertical antenna.

After doing a little research I found the resonators and accessories at most of the online ham dealers. They are used primarily as mobile and marine antennas. I had seen where a ham had used these on a ground stake as a portable antenna as well. I ordered a Hustler MO1 mast which is 54 inches tall and thought I would attempt to make a portable POTA antenna.

### ***Antenna base***

I had a couple of small aluminum plates that I drilled out a few holes. I cut out a notch to put a SO-239 Stud Mount on the plate as my antenna base. I now had a ground plate, connector, and antenna with resonator. By putting a stake in the bottom of the plate, I was able to get the antenna to stand up. The Hustler resonators have a hex screw for tuning that can be loosened. The antenna can be adjusted for resonance by lengthening or shortening the radiator length. After adjusting the radiator my SWR was still horrible on the two bands.



### Antenna base close-up

I had some 14-gauge wire laying around and attached it to the plate using carriage bolts and nuts for my ground radials. I didn't think about the length of the wires at this point but went with three or four lines around 20 to 30 ft. I was able to use my vertical a few times with moderate success. My SWR on 20 and 40 Meters was around 2:0 to 1 at best. It was bulky and very delicate. Sometimes screwing in or unscrewing the MO1 the SO239 would slide off the edge of the aluminum plate. I put away my contraption for the winter and decided to move on to something else.

In April of this year, I wanted to revisit my project. I identified a few issues that needed to be improved. The main issues with the antenna were bulkiness, took too long to set up, and really had poor performance. I attacked the SO239 problem by drilling out a 5/8 inch hole in the center of the aluminum plate and centered the SO239 mount there. I used an elbow PL259 connector so I could feed the coax under the ground plate insuring the insulator is in the correct position. The shield becomes the ground and then isolates the center connector.

I put some more thought into the ground radials. I needed to find a balance of effectiveness and time it takes to set up the antenna. The rule of thumb is more radials the better until one reaches a certain threshold. I opted to go with four radials,  $\frac{1}{4}$  wavelength for 40 Meters, which I used 32 feet and 6 inches. I assembled PowerPole connectors to the ends of the wire and onto the radials which I made

from speaker wire. I found that speaker wire was very flexible and easy to deploy and recover. The PowerPole connectors make the antenna very quick and easy to deploy.

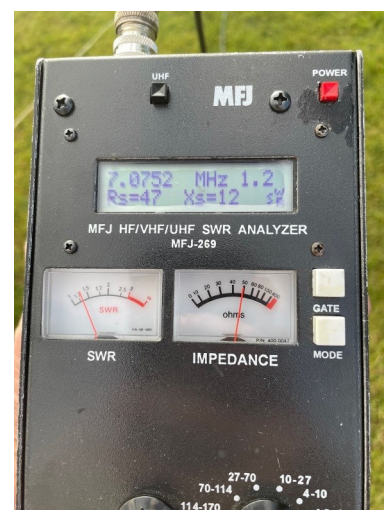
I opted for a shorter carriage bolt in the meantime and used four 3 1/2 inch bolts for the feet. I have an open slot for a tent stake if I need more stability in high winds. I purchased Hustler resonators for 10, 15, 30, and 80 Meters. This affords me a full suite of the HF bands. There are two models of resonators. The RM Series is rated for 400 watts. The RMS Series are more expensive. They are rated for 1 KW and have a wider bandwidth. Since I usually work digital or CW, I opted for the RM Series.

### Performance

My resonators are tuned for the lower ends of each band staying near the digital portions. My SWR on 40 Meters generally runs 1:2 to 1, and all the other bands do not exceed 1:4 to 1. On 40 Meters the antenna is a bit narrow with SWR above 2:0 to 1 at 7.20 MHz.

The speaker wire is very flexible and combined with the PowerPole connectors, makes [deployment](#) quick and easy. I am able to deploy the antenna in five to seven minutes. I still have the military mindset of shoot, move and communicate. I get a kick out of seeing how fast I can get on the air at a new POTA activation.

I always take my 20 and 40 Meter resonators and occasionally will take my 30 Meter. As you can see from the photograph (above), the antenna package can be carried in a







backpack with the longest item being the MO1. I will add that Hustler makes the MO2 mast that folds over at 27 inches. I have not found that necessary for travel.

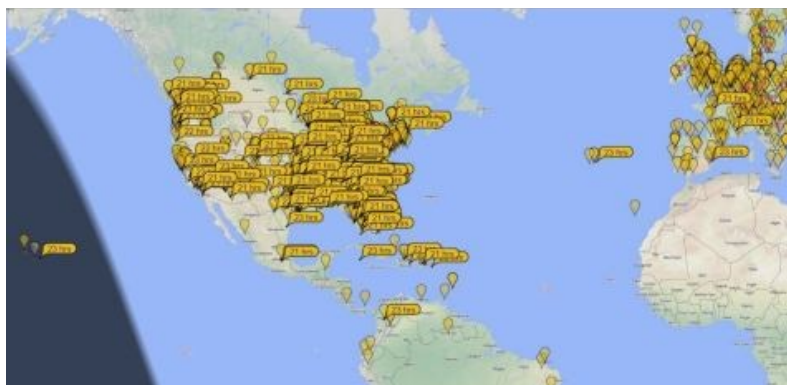
The PSK Reporter shot is from last POTA activation at Fort Erie National Historic Site. I was using an IC-705 running 5 watts. I was spotted into Hawaii and Europe. I made 21 QSO's using PSK, FT8 and a couple of SSB on 20 Meters.

This has become my go to antenna. I usually bring my Buddystick Pro and PAR 20/40 End Fed along to my POTA activations. I have not deployed those antennas in the last few activations because I find my Homebrew Vertical easier to setup and it gives me great performance.

I have a couple more things I would like to do to improve my antenna. My next priority is to make some type of hinge system for the feet. This would allow the base to be more compact and easier to carry. This is a work in progress but I am pleased with how my homebrew has performed. If you have any suggestions I would love to hear them.

~ Steve Riddle VA3FLF/KM4FLF

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### Social Reminder

The Saturday weekly social gathering is once again 'on' at the Denny's Restaurant, 6850 King George Blvd., Surrey BC from 07:30—09:30. All are invited. Afterwards, we will host workshops and will be available to invigilate Amateur Radio exams at the OTC, 5756—142 Street, Surrey from 10-noon. Bring your ham issues, our Elmers will try to help you sort them out.

Daniel Romila VE7LCG

Daniel's  
Workbench

## LiPo batteries from the garbage



I like to walk, and on my long walks I've started to see more and more of these on the streets *[top photo left]*.

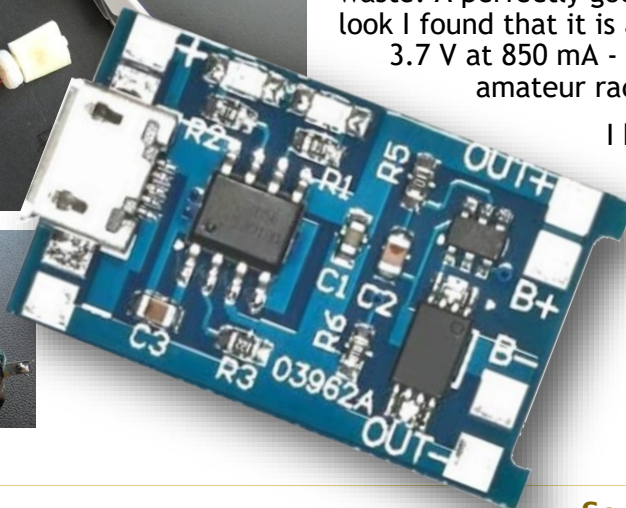
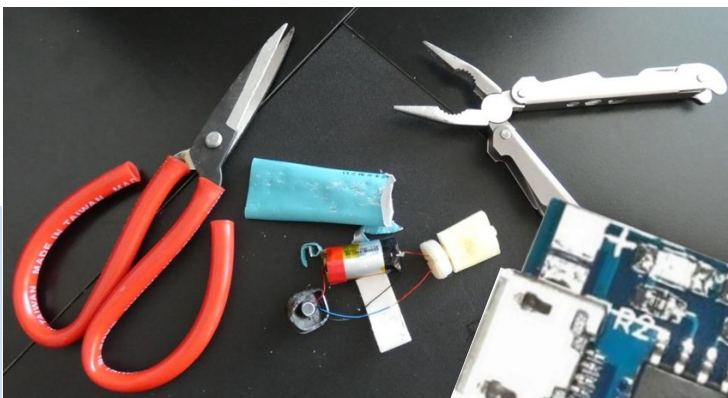
It looked very much like an electric device. I was attracted by the fact one such device was even blinking. That meant it had at least a LED and a power source.

I am not a smoker. I was told by smokers that what I see thrown out in the streets more and more often are single use smoking devices, from vaping and/or e-cigarettes. I took one home. After some surgery with big scissors, I got the metallic tube from inside *[bottom photo left]*.

There is a LiPo battery inside. Since the device is single use, that means the battery had only one cycle. What a waste. A perfectly good recyclable battery. At closer look I found that it is a LiPo with a nominal voltage of 3.7 V at 850 mA - 950 mA. This is usable for many amateur radio projects.

I have some cheap charging boards, based on the TP4056 integrated circuit.

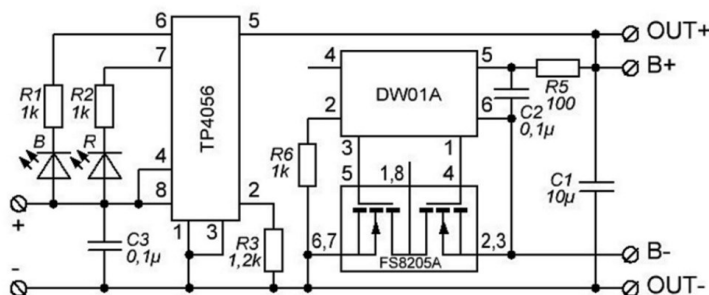
I measured the batteries that I had scavenged and all of them had above 3 V when found on the street. I soldered the



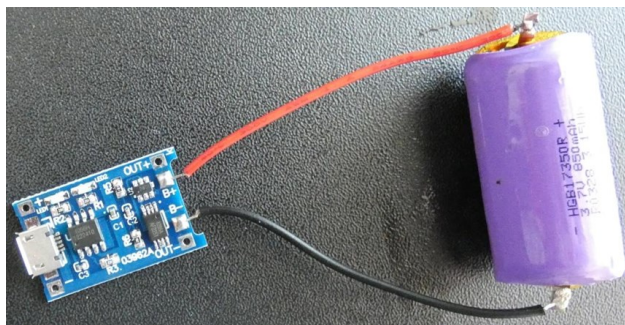


batteries one by one, and charged them to 4.15 Volts, when the charging process stopped and the red LED was OFF, the blue LED came ON.

The schematic of this board is:



As an interesting detail, I let the battery dangle from the board for several days, disconnected it from the USB power supply, and the voltage on the rechargeable battery did not drop below 4.15 Volt. It started to drop only after connecting the digital voltmeter to the battery. The same happened for all 3 recovered LiPo batteries.

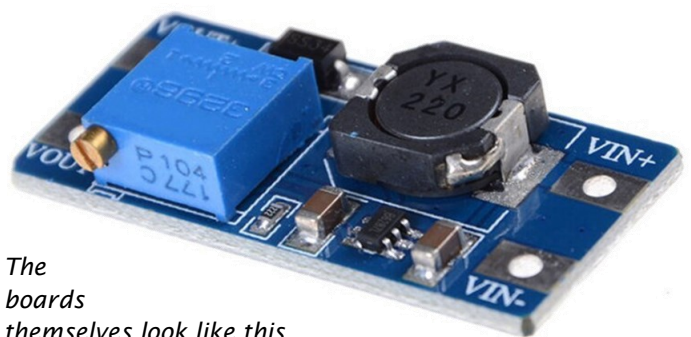
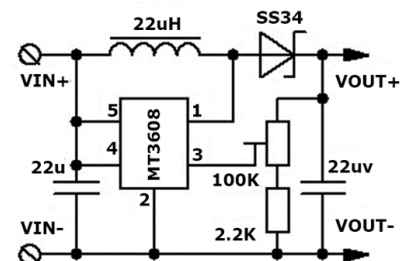


On the Chinese websites such boards can be bought for C\$ 2.15 (US\$ 1.68 = €1.65) for 5 of them, with protection on the board, with shipping and taxes included:

<https://www.aliexpress.com/item/1005004444047086>.

It can take up to 3 hours for such a battery to go from completely discharged to fully charged (4.15 Volts). Have patience. Once the battery is soldered and the charging process is started, connect a voltmeter to the battery and see if the voltage slowly increases. If it does you just need patience.

3.7 Volts is already a usable voltage, but something more standard like 5 - 9 - 12 Volts would often be better for amateur radio equipment. This can be achieved with a step-up DC to DC converter. Cheap modules are made with the integrated circuit MT3608. A simple schematic used in ready-made boards is shown right.



The boards themselves look like this.

The acceptable input voltage is between 2 and 24 Volts. The output is adjustable from 5 to 28 Volts. The maximum output current is 2 Amps. The switching frequency is fixed at 1.2 MHz. The output ripple is lower than 100 mV.

On the Chinese websites such boards can also be bought for C\$ 2.15 (US\$ 1.68 = €1.65) for 5 of them, with shipping and taxes included:

<https://www.aliexpress.com/item/1005004029395784>

Now I can walk the streets all day long and say I do something for amateur radio projects. Save the planet. Get healthy. One needs to walk plenty of kilometers to find several such smoking devices discarded in the street to recover the batteries from them.

~ Daniel VE7LCG

...more

Daniel Romila VE7LCG

## Daniel's Workbench



## Shortwave (and commercial stations, in general) listening

Talking with some older ex-radio amateurs, but also with very young people new to radio and electronics, the subject of shortwave radio listening popped-up several times, and it was quickly dropped and forgotten.

There is still interest in the subject, to hear what is there as old fashioned broadcasting - or, to be honest, to hear whatever remains from everything that once was.

The internet has pretty much killed all practical purpose for shortwave radio broadcasting, because nowadays one can listen to superior audio quality streaming from other continents at any hour, day and night over the internet, without any worry about propagation conditions. So, the practicality is not the point; more or less (if not 100%) shortwave/commercial broadcasting listening remained a kind of hobby.

In the picture is the famous Sony SW-7600, version G that I've had since 1992. I specifically bought it for listening to Radio France International when I traveled all over Europe. It



served me well and it still serves me well. Before digging in how, and with what to do shortwave listening to have fun, let's enumerate some things to avoid.

Factors that can kill the joy of shortwave (commercial broadcast stations in general, not only shortwave) listening:

- Using only a blind approach, versus using a more targeted approach. Just randomly using the radio dial in the hope of hearing a station is no longer enough. There aren't many stations left any longer, so it would be better to know on which frequency there is something in the air at that day and hour to try to catch it. There will be more about it in the next paragraphs because there is info about which stations transmits, with what power, and where from, with maps. Using only the blind approach might still bring satisfaction in Europe, but in Western Canada the blind method would seldom work.
- Unreasonable expectations for your location. That means that if one lives in a big building surrounded by a bunch of other big buildings the radio receiving results might not justify spending a single dollar on a receiver. Even in such a situation, there is still the possibility of listening to free publicly available receivers at better locations, accessible via the Internet.



More about this towards the end of the article.

- Inadequate receivers for the local conditions. Many times, cheap receivers work. Cheap and expensive receivers either have or do not have filters on the antenna input, which can receive only the noise at your location. The building in which I live has such a strong noise level that I have S5+ signal the moment I attach any antenna to a Software Defined Radio dongle that I use with computers. Without filtering I cannot listen to a useful signal. Many modern and expensive radios, like Malachite, have filters, but wide band filters, no tuned filter for specific variable frequencies. That might work or not at your location.



### Equipment

The best receiver for commercial broadcasting is the receiver from a shortwave amateur radio transceiver. Having a transceiver requires a license, so it is not the solution for everybody, apart from being expensive. There are dedicated receivers made by Grundig, Eton or the now available Tecsun S-2000 [below], for around C\$ 600 (shipping and taxes included):

Digital display of frequency helps a lot, especially when using a targeted method, and knowing in advance where the broadcast should be. Analog display receivers can be bought for as little as C\$ 20 - 30, shipping and taxes included. I wrote “analog display” because the majority of

those cheaper radios are in fact digital; inside they have a potentiometer connected with a wire to the tuning dial. The potentiometer

will develop mechanical noise after several months and the tuning will jump all over in frequency.



There are old radios made by Panasonic and Realistic which have tuned circuits and digital displays. I had such a vintage unit made by Sony, and it was a pain to replace the old electrolytic capacitors on a printed circuit board that exfoliated every time I slightly touched it with the soldering iron. To be honest, it would have been easier to build blocks from scratch for that radio myself instead of reviving those old circuits. I will never do such a thing again. Vintage receivers belong to museums (LOL).



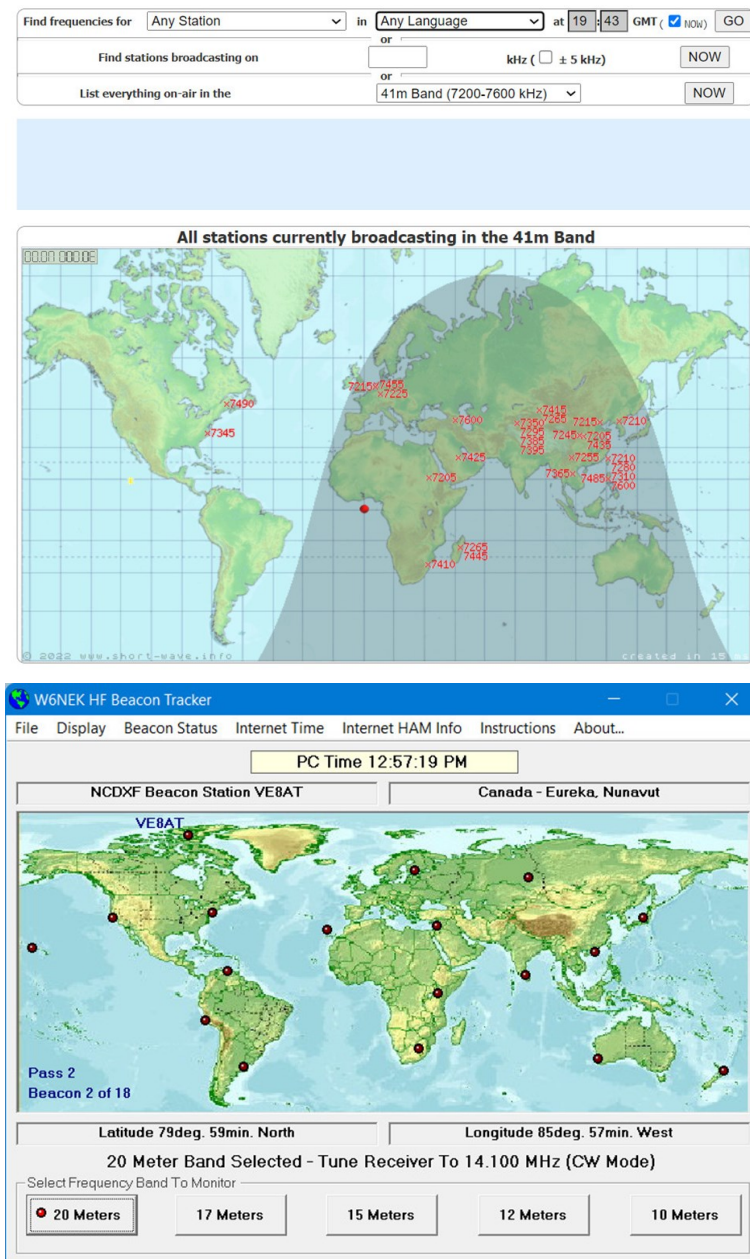
So, whatever budget one would allocate, typically less than 150 dollars for the radio and for the antenna, would ready you to listen to commercial broadcasts from all over the world.

### Targeted listening

As previously mentioned, the number of shortwave commercial stations that are still functioning is low. For example, in only the Americas (from North to South) the total maximum number of shortwave stations you can hope for, transmitting simultaneously at any given moment, is around 25.

There are many websites providing information about broadcasting stations.





My favorite is Short-Wave.Info <https://www.short-wave.info/index.php>

There I can choose either a certain station, like BBC, and find frequencies to listen to it at that moment, or get a list of radio stations transmitting in a chosen (by the user) interval of frequencies (a band).

I did not capture the table in the screenshot that is below the map, giving details about the precise location, power, name and other useful details.

As this article is intended to be published in an amateur radio publication, I must mention the excellent program 'HF Beacon Tracker' made by W6NEK and freely available at: <https://w6nek-hf-beacon-tracker.software.informer.com/>

There are amateur radio beacons placed around the world. For example, if I choose the 20 meter band, the above map will have only one lit point. The lit point will move from one location to another (all beacons from the 20-meter band are on the same frequency, so they take turn transmitting). The above program allows a listener on a receiver to verify which beacons he/she hears, from what locations on the map. This info can be useful for selecting adjacent frequencies/commercial bands before dedicating time and resources to listening to stations that you have no chance to hear.

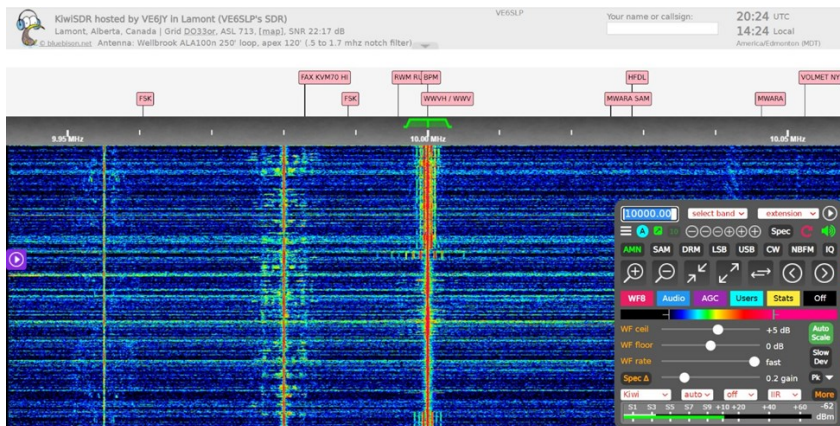
### Remote receivers

There are hobbyists who spent time and money to install receivers and antennas at their location and make those receivers available to other potential listeners on the Internet. One can go to such a website, choose the frequency and type of modulation, and listen. There is always a certain lag between what you set on your computer screen and the actual setting on the remote receiver itself, but it is acceptable.

<http://www.websdr.org/> gives a repository of remote receivers. There are details about the type of receiver, antenna, and location.

<http://kiwisdr.com/> gives similar information but for remote receivers made only with the KiwiSDR, a dedicated and powerful wide-band Software Defined Radio board, which works connected to a dedicated computer board called BeagleBone, connected to the Internet.





Other websites to consider:

<https://www.globaltuners.com/receiver/>

<https://www.ilg.de/Listening-Post/HF-Remote-Receivers.html>

I mostly use a remote receiver belonging to VE6SLP in Lamont, Alberta, Canada.

In conclusion, today one can listen “in style” to whatever commercial stations remain on the radio waves today. Sometimes I use my own equipment, locally.

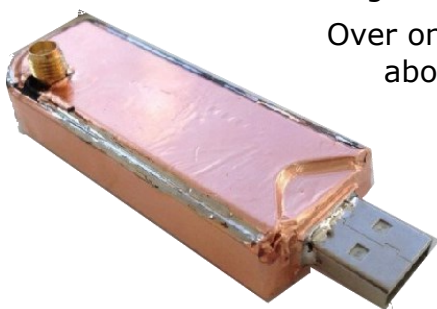
I confess that for me this hobby has mostly become an opportunity to verify what others can hear from locations around the globe. If I use an online remote receiver, I hear the many stations an inhabitant of Hamburg (for example), with a simple radio can hear there. Yes, I know, the grass of others is always greener (LOL). Another practical application by using such remote receivers connected to the Internet is calling CQ and trying to hear your own signal at various points on the globe.

~ Daniel VE7LCG

## Simple RTL-SDR shielding with copper tape

Shielding the RTL-SDR helps to reduce out of band interference which can enter the device through the PCB itself.

Now Melih, another RTL-SDR experimenter has recently posted on his blog about his simpler shielding method that uses cheap copper tape. The copper tape was purchased from eBay, and is the type that is commonly used for creating a slug barrier in the garden.



Over on the [Reddit thread discussing his work](#), there are some concerns about excessive crystal drift due to there being no ventilation holes. However, it seems that the general consensus is that lack of ventilation will not significantly affect crystal drift and may actually help to stabilise the crystal over time by keeping the internal temperature more constant.

~

...more

Daniel Romila VE7LCG

# Daniel's Workbench

 with  
Cristian Ene Roata YO8ERC


## A review of the MSI2500 RSP1 early 2022 clones

My co-author for this article is [Cristian Ene Roata YO8ERC](#) and he is a passionate radio amateur from a village called Horpaz, on the Eastern side of Romania, close to the bigger town called Iasi. I met him on EchoLink. Even if you look only at his antennas, you understand Cristian is serious about radio.

For a long time, I wanted to improve my SDR (software defined radio) receiving experience from an RTL dongle to something better. The maximum sample rate of an RTL dongle that does not drop samples is 2.56 MS/s. It is an 8 bit device, with a working frequency between around 25 MHz and 1.7 GHz. The lack of shortwave is more annoying with this type of dongles, than its lack of sensitivity. Also, it does not have enough bandwidth/processing power for proper stereo

decoding and the lack the RDS text some radio broadcasts transmit, but it still works acceptably well for those purposes (stereo and RDS decoding). To cut a long story short I paid double the money and here is what I got. (I took a picture of my old RTL dongle and the new RSP1 clone box, for comparison).

The next step for an RTL dongle is RSP1, but the price for the originals were way above what I wanted to pay, at the beginning of June 2022.

Such an SDR receiver would be useful for me just because it goes from 10 KHz to above 1 GHz, it has a bandwidth of 10 MHz and I would be able to test all kind of signals I generate from my projects, measure in the SDR software (preferable in SDRUno) and take screenshots for articles. There is not a real ham radio purpose here with which to justify a C\$165 investment or more. It is a 12-bit device.

Cristian, the co-author of this article, had an immediate purpose for such an SDR receiver and invested in a MSI PanAdapter (C\$46). It is an RSP1 compatible device







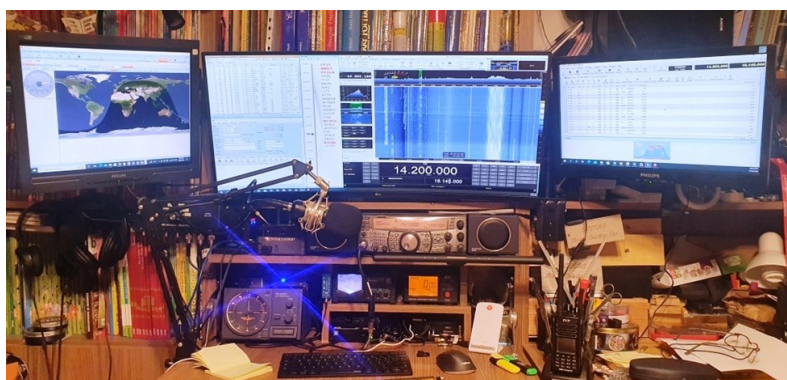
Select Product Quantity >>

| Product                  | Price as VAT<br>USD \$ | Quantity             |
|--------------------------|------------------------|----------------------|
| Radio                    |                        |                      |
| <a href="#">RSP1A</a>    | 117.00                 | <input type="text"/> |
| <a href="#">RSPduo</a>   | 299.00                 | <input type="text"/> |
| <a href="#">RSPdx</a>    | 214.00                 | <input type="text"/> |
| Shipped by Courier 31.53 |                        |                      |
| Shipped by Mail 13.87    |                        |                      |
| VAT GB                   | 0                      | 0.0 %                |
| Total                    | \$ 0.00                |                      |

*Product prices at the time of writing this article.*

(clone) that he needed to display the intermediate frequency from an old Kenwood TS2000 on the computer. This transceiver has IF output for this. YO8ERC has a nice setup.

Here are two pictures that he gave me:



The MSI PanAdapter is exactly in the middle of the next picture. At the beginning of June 2022 you could buy an MSI PanAdapter - that metallic blue case with a dolphin on it - from the Chinese websites for C\$46, shipping and taxes included to Vancouver, Canada.



This was above what I wanted to pay, for the PanAdapter, my limit being somewhere at C\$30, shipping and taxes included.

I paid C\$26 shipping and taxes included for what it is called “10kHz - 1GHz Msi2500 Msi001 Simplified RSP SDR Receiver Amateur Radio + Metal case”. I paid this “huge” price because I also wanted the case.

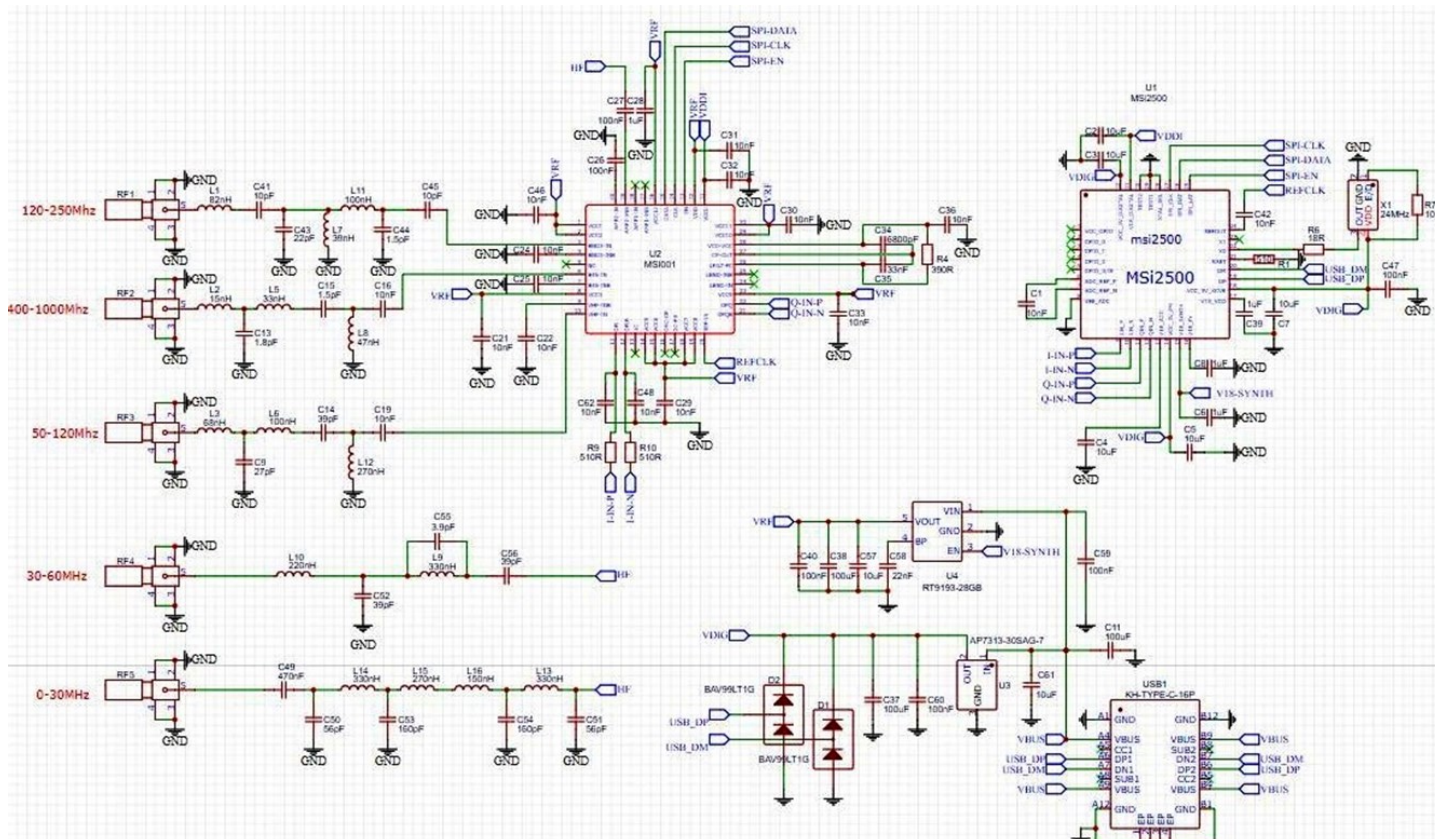
What I bought is shown in the first picture of this article. A slightly better case would cost you around C\$31, shipping and taxes included. The metallic case can also be bought separately, if you were very cheap and bought only the board, and after decided that yes, it deserves a dedicated case.

Of course, I opened the case. I found out there is absolutely no intentional connection between the case and the board. No dedicated one point wire or screw for ground.



But the board has 5 SMA connectors, which go through a side panel in my cheaper version and which have screwed washers on the more expensive version. This means plenty of ground connection between the board and the case. I preferred my case because it was smaller.

The USB port is type C, which is not yet in common use. The USB-C cable brings not only the power supply to the SDR box, but also assures the communication with the computer. I bought the USB-C cable from the



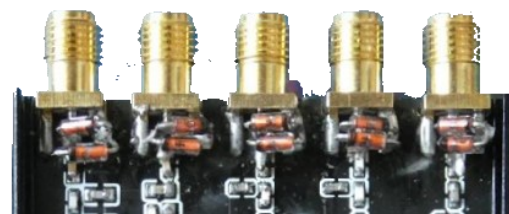
same vendor in order to be able to complain to the vendor if the SDR box would have not worked with the computer either due to the cable, or due to the SDR board.

The schematic of the board confirms what can be seen with the naked eye: there are no protection diodes on the inputs.

The so-called simplified version has separate physical inputs which enter filters for five bands of frequencies. After the filters those bands also enter four separate inputs of the MS1001 (two filters are connected together, so 10 KHz - 30 MHz and 30 MHz - 60 MHz are on the same input, named "HF"). Nobody can stop a user from shorting the 5 SMA connectors and use only one SMA connector for all bands. I liked the idea of having separate antenna inputs for various projects, and the ability to hang several projects on

the SDR case at once without moving and removing SMA cables. According to the schematic there is a gap between the filters and it would not be possible to receive the frequencies between 250 MHz and 400 MHz because of the rejection of the RF input filters. On the case there is no gap between the frequency intervals. I suspect that what is written on the schematic, identical with what is written on the board, is right, and what is written on the case as 250 MHz - 1000 MHz is just marketing, fake advertising.

The first thing I did after getting the SDR receiver was to solder 10 Germanium diodes 1N60 at the inputs:

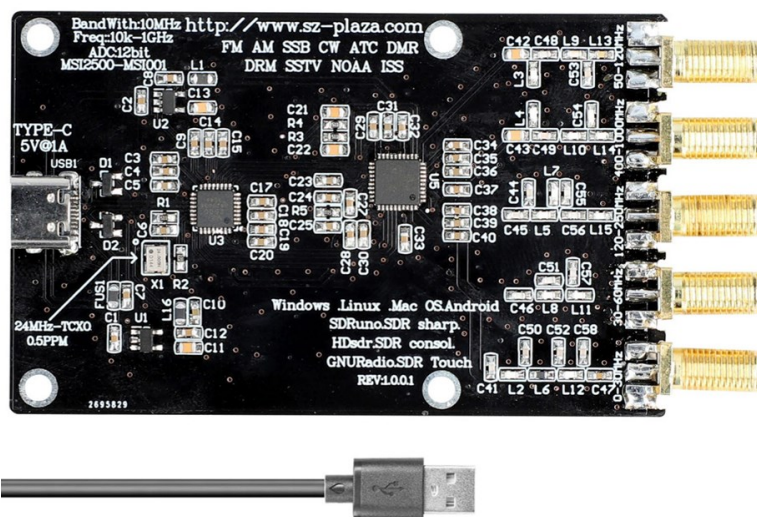




The protection diodes do affect the sensitivity. It was not easy to solder them. I had to completely remove the board from the case and re-solder the adjacent SMD devices which immediately had the tendency to fly out when I put the soldering gun on the board to solder the diodes.

Many people complained on [aliexpress.com](http://aliexpress.com) that they played with the RSP1 clone for several hours and after that it became deaf. Everybody suggested adding protection diodes. None of us who started with soldering the diodes first and only after that electrically connecting the USB cable, had any problem with burned chips. I did have a deaf input, and I believe I moved an input capacitor from the filter. I took a lens and it was exactly that. I repaired the board in several seconds. If you decide to buy this RSP1 clone, correctly evaluate your SMD soldering skills. There is no room for diodes. It is not an easy task. Pay attention to not shortcut the board to the case with the diodes' terminals.

Buying only the board would save some dollars. The board and the USB cable can be bought for C\$22.80, shipping and taxes included. It is worth buying the case, too, for just C\$4 more.



The board length is 92 mm (3.62 inch) and, the SMA connectors soldered to the board, at their full length increases length by 50 mm (1.97 inch).

After I was sure I would not burn out the chips with my antennas, I connected it to the computer, and I used the recommended SDRUno software, which immediately recognized the device as RSP1. I also used SDR Console v3.3 and older SDR Sharp versions. I use SDR Sharp v1.0.0.1672 with an EXTIO extension. I use the extension and instructions how to use this extension from [https://github.com/Sir-Loin/SDRPlay\\_SDRSharp\\_Plugin](https://github.com/Sir-Loin/SDRPlay_SDRSharp_Plugin)

It also works with SDR++ v1.0.4 and HSDR v2.8. HSDR requires the EXTIO extension for RSP1, too. It does not work for me with SDR Angel. I can confirm SDRUno, at least the version 1.41 that I use, hangs from time to time. It also does things by itself, going at its own will from 144 MHz to 10 KHz, and I have to restart the program. Older versions of SDRUno crash the computer immediately when trying to start them in Windows 10 and Windows 11.

I made a comparison between the RSP1 clone and SONY ICF-SW 7600G and I found the sensitivity to be close in the shortwave band. I used a 10 meter beacon that is 14 km from my location and the Sony double conversion superheterodyne looked just a bit more sensitive for some stations and less for others. The SONY ICF-SW 7600G has a wide input, no filters in front. Without separating between AM/FM/SSB modulations I estimate the workable sensitivity as 5 microVolt. This is the sensitivity of an MS1001 chip taking into consideration the filters and the diodes in front of its inputs. More precise measurements were done by somebody on the forum:

<https://www.sdrplay.com/community/viewtopic.php?t=3988&start=10>

I copied a clip from there:

```
Noise Figure @ 1 MHz, - with maximum gain
RSP1A 21.2 dB
RSPduo Tuner 1 SMA 20.77 dB
RSPduo Tuner 2 SMA 19.33dB
RSPduo Tuner 1 HiZ 11.66 db ****

Sensitivity for AM signal @ 136 kHz, - with 60% Mod - 12 dB SINAD
RSP1A 6.02 microvolts
RSPduo Tuner 1 SMA 6.16 microvolts
RSPduo Tuner 2 SMA 5.36 microvolts
RSPduo Tuner 1 HiZ 0.37 microvolts ****

Sensitivity for SSB/CW signal @136 kHz, - 1.5 kHz, BW - 12 dB SINAD
RSP1A 2.26 microvolts
RSPduo Tuner 1 SMA 2.29 microvolts
RSPduo Tuner 2 SMA 1.99 microvolts
RSPduo Tuner 1 HiZ 0.18 microvolts ****

**** HiZ port is 1000 ohms but microvolt sensitivity has been converted to 50 ohm
```

Using the same chips, the same manufacturer, there is no difference between the original RSP1 and the Chinese clones. There are images of commercial stations from MW all over, and the same for the commercial FM stations. This would eventually be solved with additional filtering.

I had a radio conversation with VE7HMM over the VE7RPT repeater. He uses the original products, not the clones, on Apple computer, and has the same problems that we have with the clones. All the problems come from the integrated circuits MSI001 and MSI2500 and from the software. It looks like an unfinished product, same as the originals. The two main weak points:

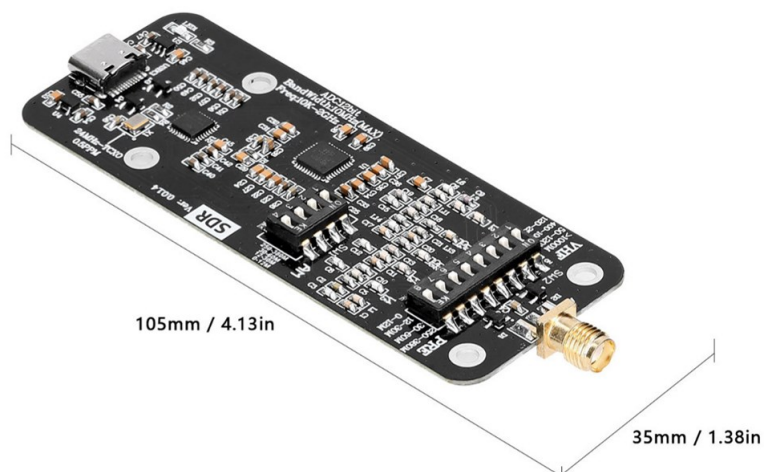
- Sensitivity
- Buggy software, unfriendly to use (I am talking here about SDRUno)

Comparing it with the RTL dongles it is superior in bandwidth (10 MHz at once versus some 2 MHz) and range of frequency to be used. It does require more processing power from the computer, and it can cause a third generation I-5 Intel processor to falter if the computer is set to the “balanced” power consumption scheme. It

starts and stops alternating until the power scheme is changed into the “performance” mode. The RTL dongle is easier to use. The sensitivity is comparable.

All the changes from ZIF into LIF radio modes for RSP1 originals and clones do not eliminate images. If the intent is to use only 144 MHz and above I would definitively go with RTL dongles.

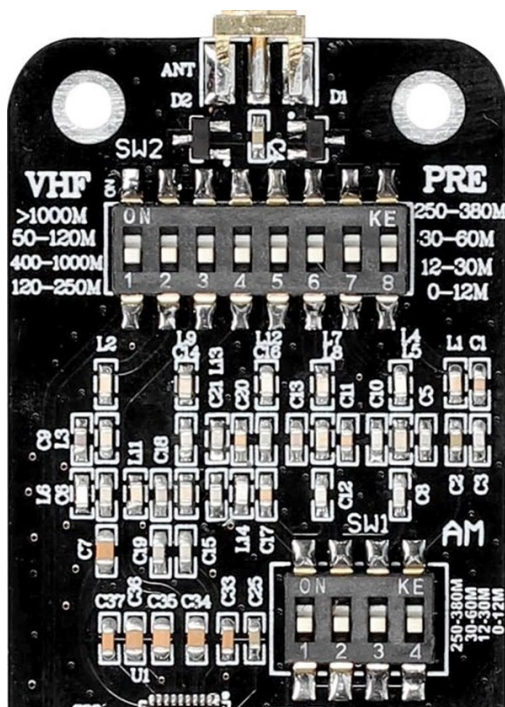
Taking into consideration the problems users had with burned-out devices, the Chinese manufacturers came out with a new version several months ago (we are at the beginning of June 2022).



The board with a USB cable costs around C\$26, shipping and taxes included. The first thing to notice are the SMD diodes next to the SMA antenna connector, noted D1 and D2, respectively.

This clone version has 8 input filters instead of 5 filters. They are selectable with switches. Any or all of the band filters can be connected to the SMA input antenna. Put the switch ON, and that band connects the antenna to the MSI001 chip inputs. In this version of the clone the chip itself MSI001 also has 4 inputs used, collecting bigger chunks of frequencies, as written on the PCB. 4 inputs - 4 switches. Put the switch ON and that band can be received.





The disadvantage of this clone is that it does not have a case, and putting it in a case would make it difficult to change the switches.

For my needs I prefer the case with 5 SMA antenna connectors, even if 8 filters would be a better way of getting rid of unwanted signals.

I would describe the RSP1 clones that flooded the Chinese website as

still being in the gizmo category, like the RTL dongles. They really give the impression of unfinished products, unlike their original counterparts. All the bugs I found in the dedicated software for RSP1 versions, made by the originals' manufacturer, the application called SDRUno, are present for both originals and clones. More so, the manufacturer writes on its website that it knows of the bugs, gives a list of them, and says it is working on them.

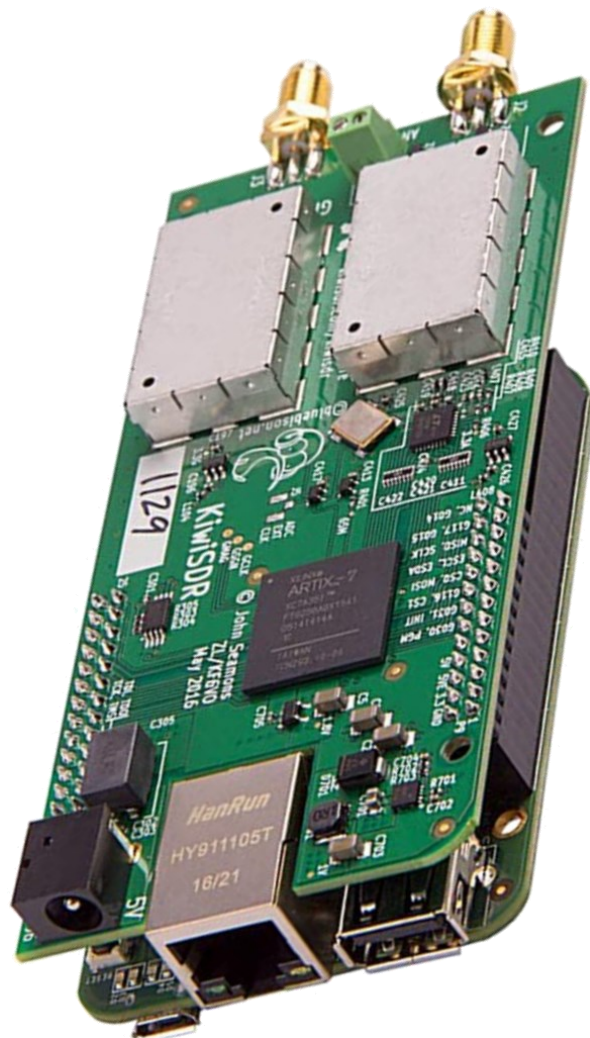
If the intention is to use the RSP1 clones in the manner that YO8ERC uses it, just for the intermediate frequency of a transceiver, those clones are as fine as the originals.

Unfortunately they are not a serious product like KiwiSDR. I live in Vancouver, BC and whenever I want to verify radio devices I use an online KiwiSDR from Lamont, Alberta at URL:

<http://kiwisdr.ve6slp.ca:8173/>

He has good hardware and also good antennas. After I hear the station on his

KiwiSDR I try to catch the same at my location and improve the reception on that frequency, once that I know it is possible. While an RSP1 clone is under C\$30 shipping and taxes included, an SDR device that no longer feels like a toy, like an unfinished product, costs more than C\$500.



*KiwiSDR mounted on a dedicated computer board Beagle Bones (something like a Raspberry Pi).*

~ Daniel VE7LCG and  
Cristian Ene Roata YO8ERC

# Ham Radio Hacking...

Al Williams

## *Thinking inside the box*

There are two ways to deal with improving ham radio receivers, or — for that matter — any sort of receiver. You can filter and modify the radio frequency including the radio's intermediate frequency, or you can alter the audio frequency output. Historically, RF and IF techniques have been the most valued because rejecting unwanted noise and signals early allows the rest of the radio to focus on the actual signal of interest. However, audio filters are much easier to work with and until recently, DSPs that could handle RF frequencies were expensive and uncommon. However, [waters-stanton] shows us how to make what could be the [cheapest audio enhancer ever](#). It is little more than a modified cardboard box, and you can see and hear the result in the video below.

On the one hand, you shouldn't expect miracles. On the other hand, you probably have box laying around and can try it in the next three minutes so why not give it a go?



You can hear a bit of difference when using the box and not using the box.

In particular, you can tell, too, a difference in the position of the box. He also encourages you to experiment with different materials.

*The alternative?*

He likens it to cupping your hand around your ear to direct sound flow. We've actually seen passive amplifiers for phones that are not much different than this.

We are firm believers that [ham radio doesn't have to be an expensive hobby](#). You can [scrouge quite a bit of gear using almost nothing](#).

Watch 'the magic cardboard box trick' at <https://youtu.be/JouYdsxMDK8>

~ [Hackaday](#)

Alternately there is:

<https://www.ebay.com/itm/154954542013>





...more

Daniel Romila VE7LCG

## Daniel's Workbench



Où sont les neiges d'antan

or where are the analog radio integrated circuits in 2022 that I once used?

In the year 2022 the radio world is dominated by digital circuitry. Some hobbyists still build and use analog projects. A classic analog superheterodyne allows the radio amateur to have fun by designing, building, optimizing, and tuning. Digital circuitry is more limited in this regard, limiting the hobbyist to use his/her hands with bench tools like voltmeters, signal generators and an oscilloscope. I do not say that digital circuitry does not give satisfaction and does not require bench adjustment at all, but it is different. It is a different feeling. We mostly build things just for fun, not for use. This article deals mostly

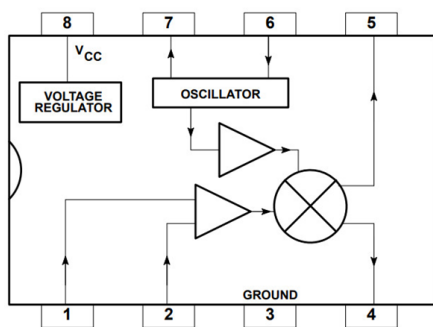
with the integrated circuits that were used in making superheterodyne receivers and that many of us, older generation, have nostalgia for.

A first integrated circuit to start with was NE602 [left]. Its newer incarnation is NE612, is

also sold as SA612, with the same internal schematic.

The manufacturer(s) call it double-balanced mixer and oscillator. Some constructors misunderstood that it has a double-balanced mixer that it is so balanced that one does not need to adjust it from outside and - without any outside adjustment - it can be used to generate double side band signals, meaning it suppresses the carrier. This never worked OK. It never worked with the original NE602, and it does not work with NE612, although there are kits sold as DSB generators, and DSB transceivers based on this integrated circuit. I tried and it does not work. All builders of those kits complain the carrier flows in the rest of the circuitry.

The integrated circuit is awesome, and it works in shortwave, under 45 MHz. In its datasheet it is declared to work up to 500 MHz. That means that it works, not that it works well, not that it works at least acceptably. It has a noise figure of 5 dB at 45



MHz. The most common NPN transistor used today, 2N3904 has the same declared noise figure.

It is an easy way to make a converter, eventually putting a crystal in its oscillator part. I used it as VFO and I also used it as XO. It gives 60 mV output signal, which is enough for the internal circuitry but not enough for activating an external frequency meter. It works best with balanced input and balanced output. I used it as balanced and as non-balanced. One inconvenient aspect is the power supply for it must be between 4.5 V and 8 V. That means it requires separate stabilizer than the MOSFET stages which usually work at 9 V (see BF998 - for example) and separate from other radio ICs that work at 3 V. The input impedance is 1.5 KOhm. Same for the output. Such low impedance kills the quality of any LC circuit connected directly, as I saw in many schematics.

*In May 2022 the price of NE612 is around C\$2.50 a piece, shipping and taxes included. It is an expensive integrated circuit.*

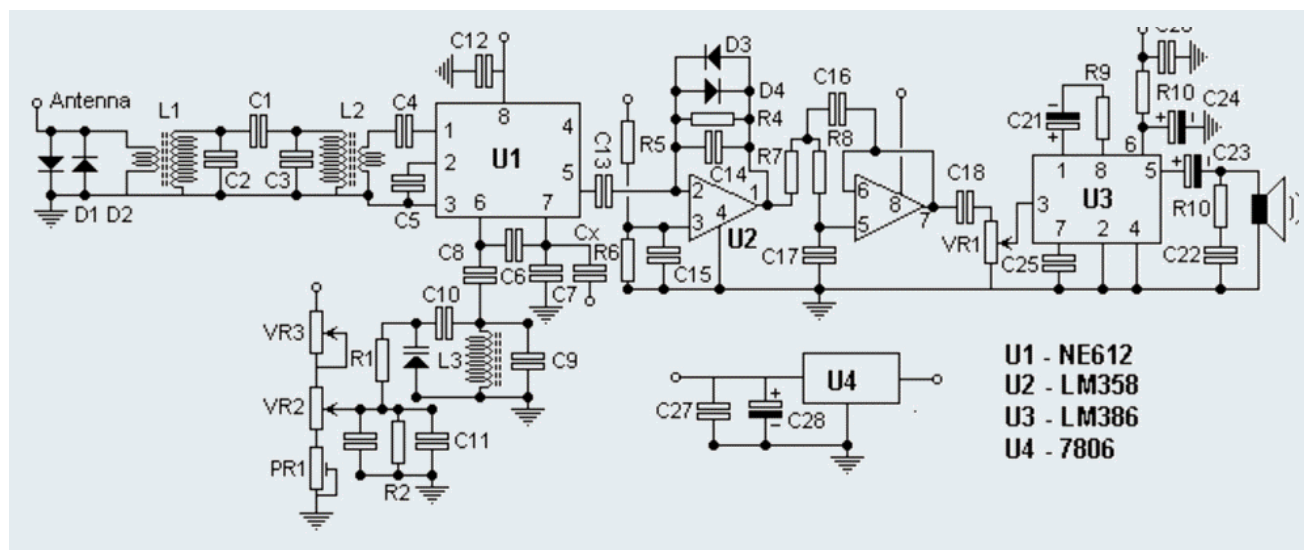
A famous schematic of a direct conversion receiver was made by VU2UPX, but the same schematic is all over the internet, signed by various authors.

Please see [https://www.qsl.net/va3iul/Homebrew\\_RF\\_Circuit\\_Design\\_Ideas/HF\\_DCR\\_VU2UPX.gif](https://www.qsl.net/va3iul/Homebrew_RF_Circuit_Design_Ideas/HF_DCR_VU2UPX.gif) for all values of components and the PCB.

Somebody desperately tried various schematics, builds and experimented a lot to get rid of the carrier, and we can learn from his failure as NE612 cannot be used as a DSB generator:

<https://electronics.stackexchange.com/questions/467592/adding-two-balun-transformers-to-sa612-mixer-has-no-effect-on-lo-suppression>

It is an easy, stable, and comfortable direct conversion, front end in lower bands superheterodynes and converters from one band into another, under 30 MHz.

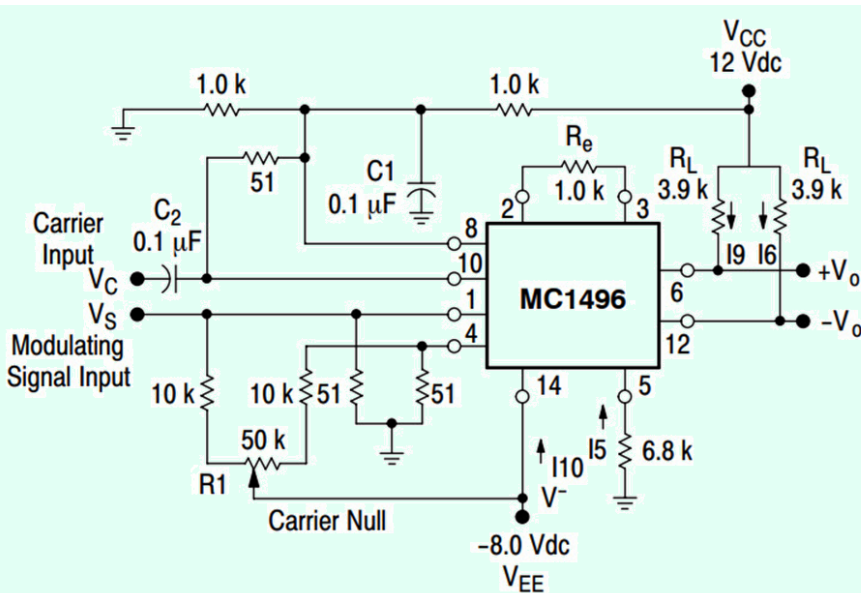


If we are to talk about DSB generation, MC1496 is the integrated circuit to talk and write about. It has an external adjustment for suppressing the carrier, which is guaranteed to be better than 65dB at 0.5

MHz. The schematic is shown on the next page.

*In May 2022 the price of MC1496 is around C\$5.00 for 5 pieces, shipping and taxes included.*



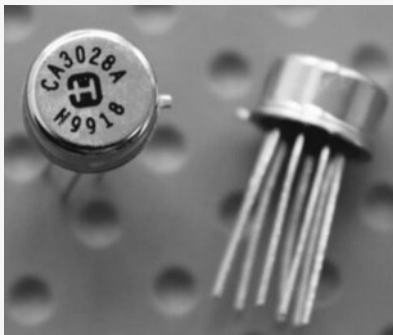


A complete 20 meter transceiver based on MC1496 integrated circuit can be found at:

[https://www.qsl.net/va3iul/1496\\_HDR\\_20m\\_TRX/1496\\_HDR\\_20m\\_TRX.htm](https://www.qsl.net/va3iul/1496_HDR_20m_TRX/1496_HDR_20m_TRX.htm)

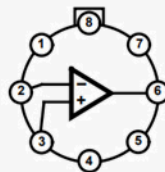
Another interesting old option for direct conversion receivers and for DSB generation is CA3028

[shown below].

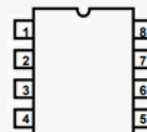


#### Pinouts

CA3028A/B, CA3053 (METAL CAN) TOP VIEW

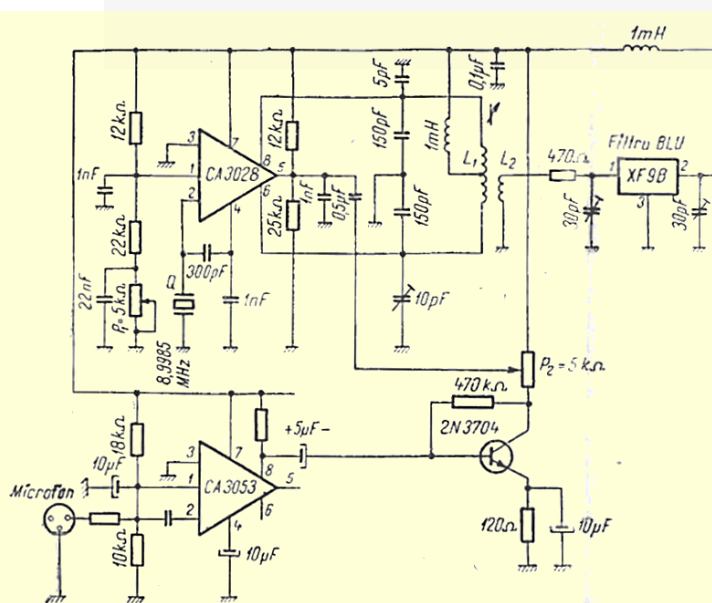
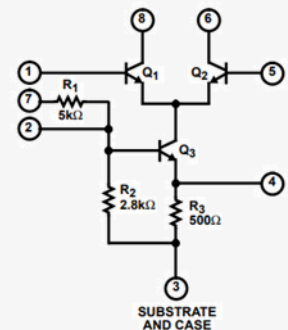


CA3028A/B, (PDIP, SOIC) CA3053 (PDIP) TOP VIEW



#### Schematic Diagram

(Terminal Numbers Apply to All Packages)



In May 2022 the price of CA3028 is around C\$7.00 for the round version, shipping and taxes included, and C\$3.50 for the 8 pin version, shipping and taxes included.

A simple CW transmitter + direct conversion receiver schematic can be found at:

<https://ftp.unpad.ac.id/orari/orari-diklat/teknik/qrp/MY%20FIRST%20QRP%20RIG%20THE%20BAREFOOTER.htm>

[Left: A classic schematic with it]

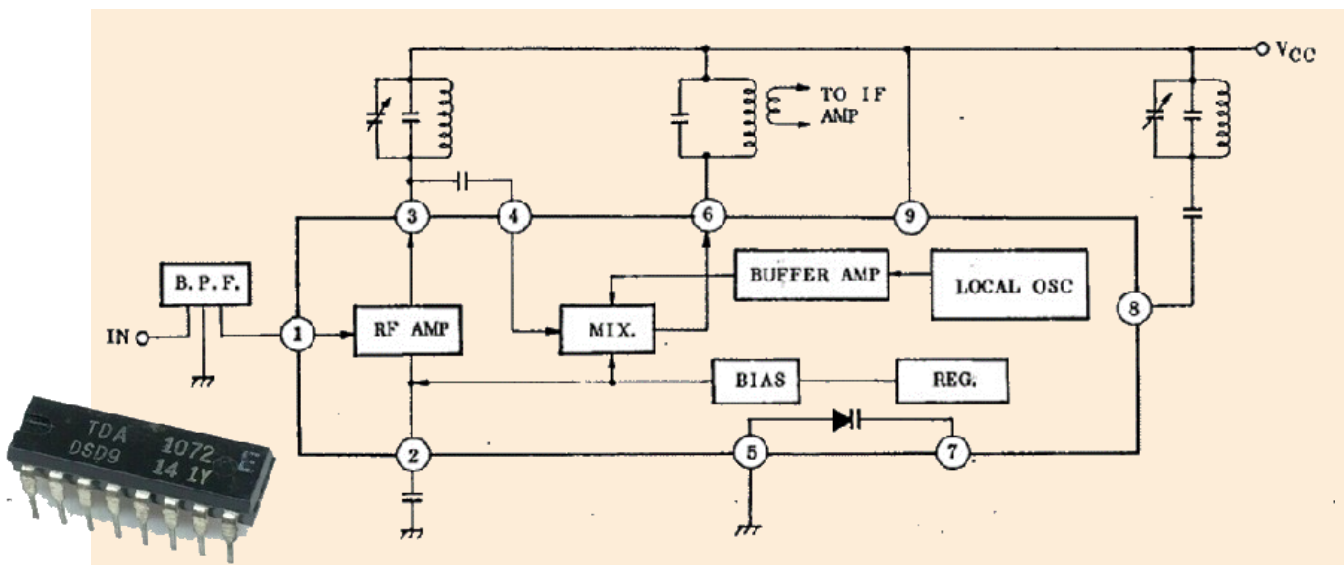
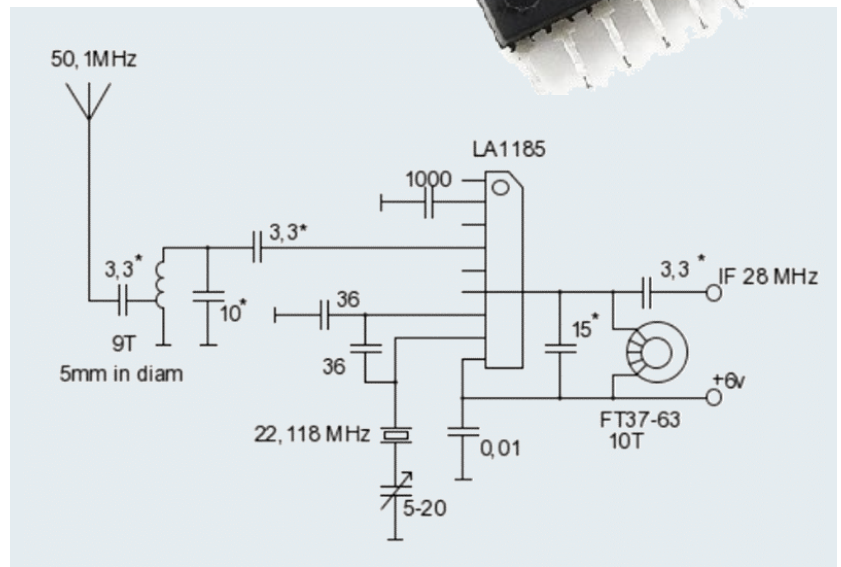
But coming back to the NE612 integrated circuit, which is mostly seen as a front end (RF amplifier, oscillator, and mixer) for a superheterodyne receiver the integrated circuit most close to it is LA1185.

It has the advantage of accepting a lower voltage power supply, from 1.5 V to 8 V.

*In May 2022 the price of LA1185 is around C\$6.00 for 10 pieces, shipping and taxes included.*

LY3LP designed a 50 meter to 30 meter band converter. The input is done directly into the mixer, which has a higher impedance, and the first RF stage is not used.

The TA7378 integrated circuit [below] is similar to LA1185 and incorporates a varicap diode, accessible between pins 5 and 7.



I have a particular spot in my heart for the TDA1072 integrated circuit. It was the first superheterodyne I ever built for shortwaves, and it worked awesome. It was meant only for AM and I made several attempts to make it work for SSB too. I always failed, as others did, because any oscillator on the intermediate frequency activated the AGC (automated gain control) and killed the sensitivity. I was happy to find that TDA1572 has a pin for accessing the intermediate frequency to use a dedicated external SSB product detector.

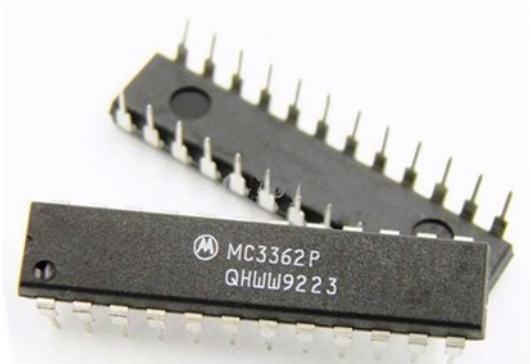
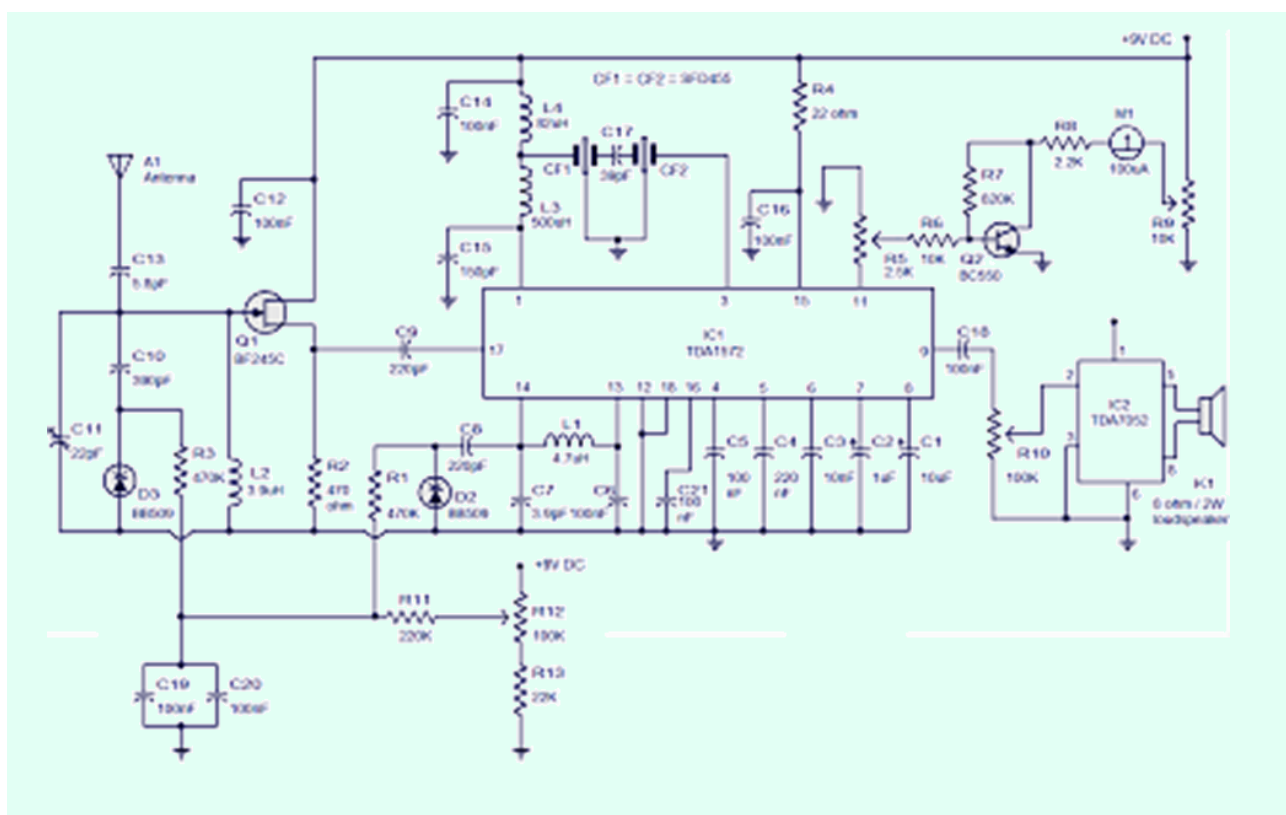


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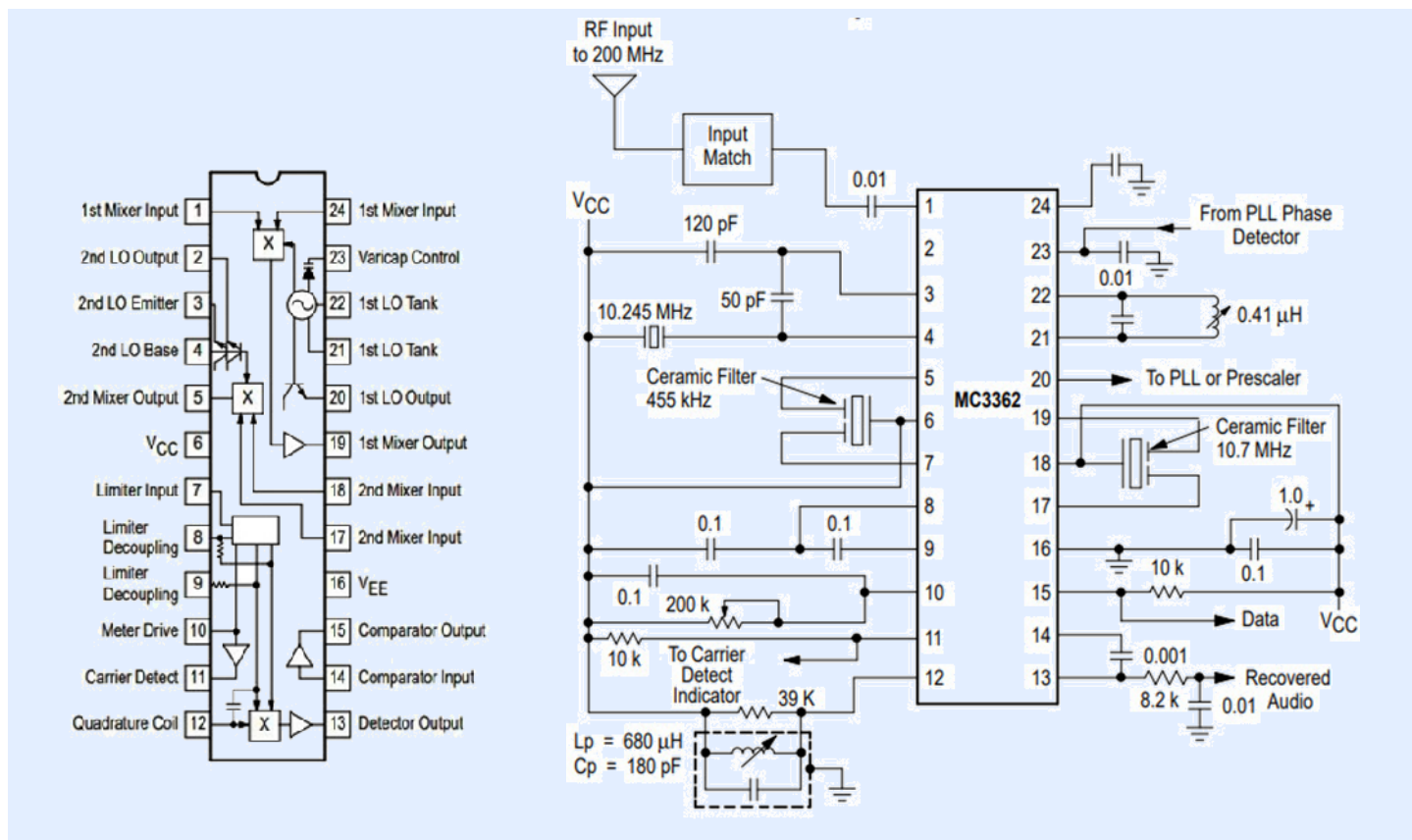
*In May 2022 the price of TDA1072 was C\$4.35 for 5 pieces, shipping and taxes included. TDA1572 was C\$19.00 for 5 pieces, shipping and taxes included. That is what I call an expensive IC.*

The schematic can be found on various websites, based on the manufacturer's datasheet:



MC3362 is a double conversion superheterodyne dedicated to narrow FM communication. There are many available kits for building ham radio receivers with it. Because it contains so many blocks people use them even as single conversion superheterodyne for SSB reception, and the second mixer and oscillator are then the SSB product detector.

*In May 2022 MC3362 could be bought with C\$2.65 for 4 pieces, shipping and taxes included*

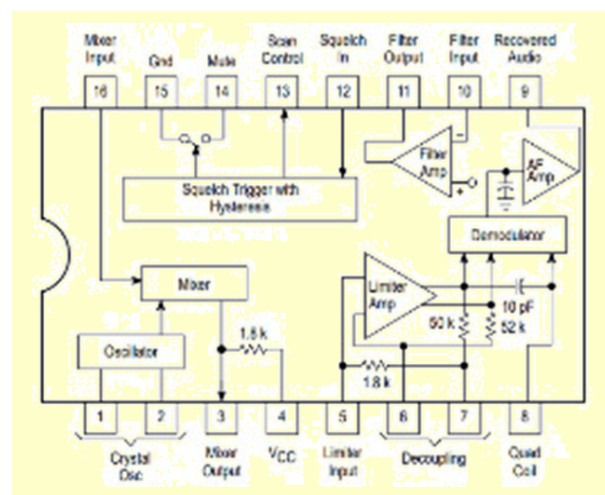


Elenko AR-2N6 is a receiver kit, for the 2 meter and 6 meter band. There is a complete schematics and assembly guide which can be used for the kit or for your own design at:

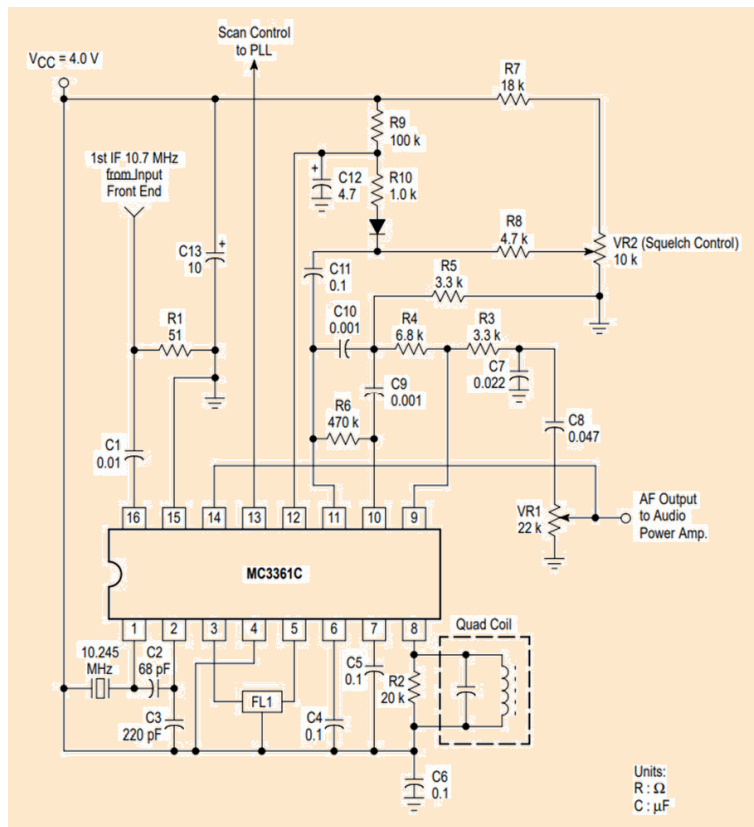
<https://www.electrokit.com/uploads/productfile/41000/ar-2n6k.pdf>

MC3361 is a smaller brother of MC3362. It is the second conversion of a double conversion superheterodyne. It works at lower frequencies, up to 60 MHz. I personally never used it but there are plenty of schematics for direct conversion receivers and CW/SSB shortwave receivers. The nice thing with those complex integrated radio circuits is that one can use only some of their blocks, if they are cheap enough.

*In May 2022 one could buy MC3361 for C\$3.30, shipping and taxes included, for 5 pieces.*







There are a big number of integrated circuits containing superheterodyne receivers, some include both AM and FM. I will only mention several models here that radio amateurs tried to adapt for ham radio communication, often by using only the front blocks in a direct conversion type of receiver.

TA2003, pin compatible with TA8164, is an AM and FM superheterodyne. It does not do any of them well. It does not have AGC on the FM part.

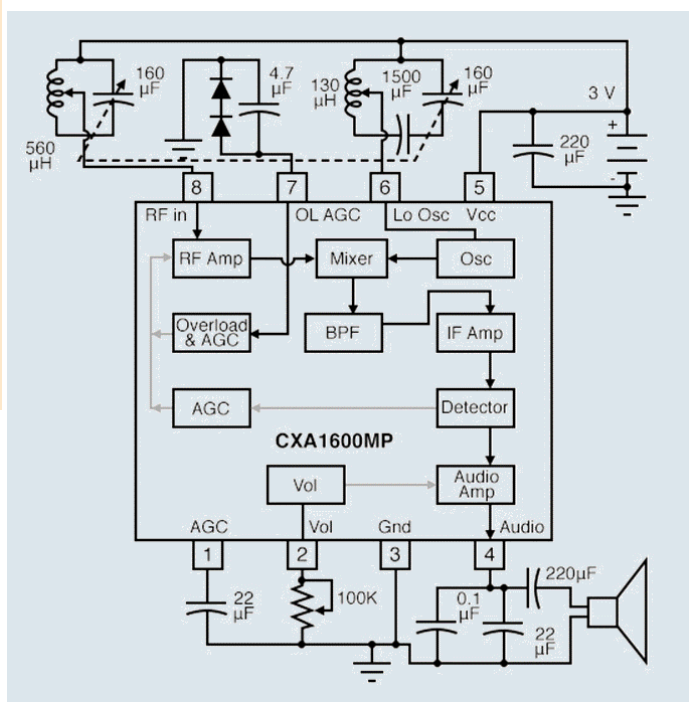


Many people, including me, used this integrated circuit for the 144 MHz band. I used an external VFO

I have reproduced a typical simple schematic [left] from the datasheet.

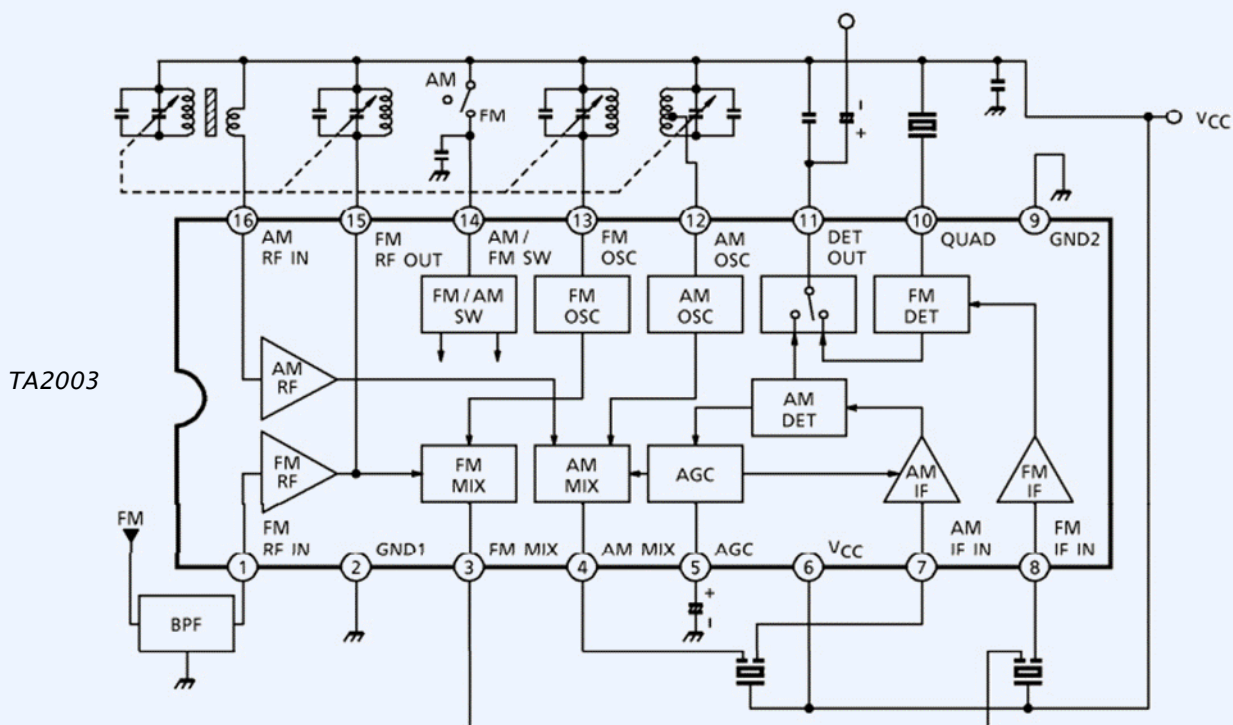
A special 'Rest in Peace' here for the wonderful Sony integrated circuit CXA1600MP, shown below, which contained a complete AM superheterodyne and within it included the intermediate frequency filter and the audio amplifier.

I could not find it for sale anywhere. I suspect it is not produced anymore.

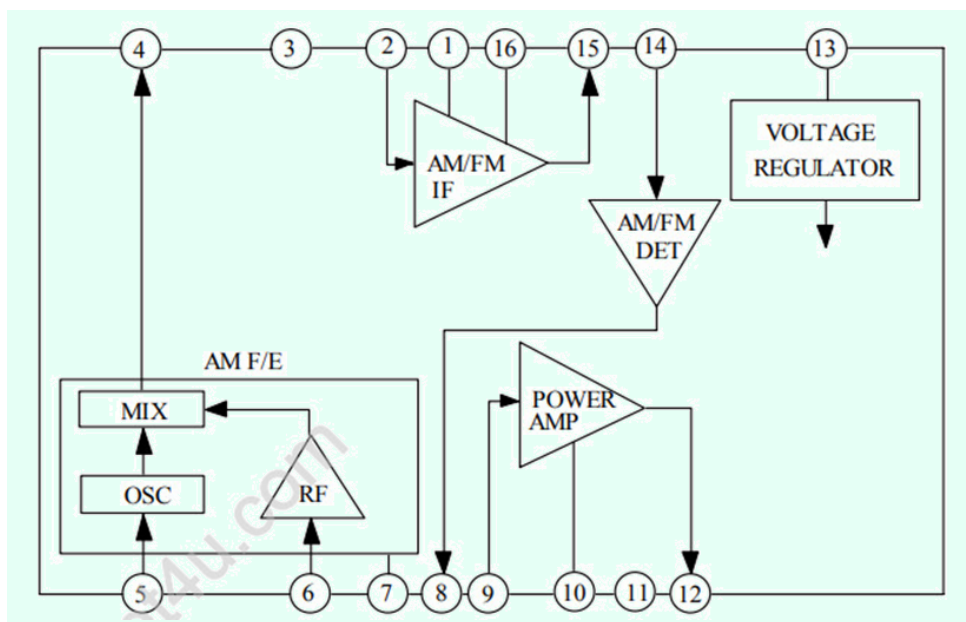


because its internal oscillator is not stable enough. Typical application of TA2003, from its datasheet, shown on the next page.

It is a cheap and simple IC. In May 2022 it could be bought for C\$3.45 for 10 pieces, shipping and taxes included.



The integrated circuit CD7613 [below] contains an audio power amplifier, an AM front end completely accessible at the pins, an intermediate frequency amplifier completely accessible at the pins and an AM/FM detector completely accessible at the pins.



Radio amateurs did all kind of things with it, due to the accessibility of its internal blocks. It does not have an FM front end. From the free datasheet4u.com:

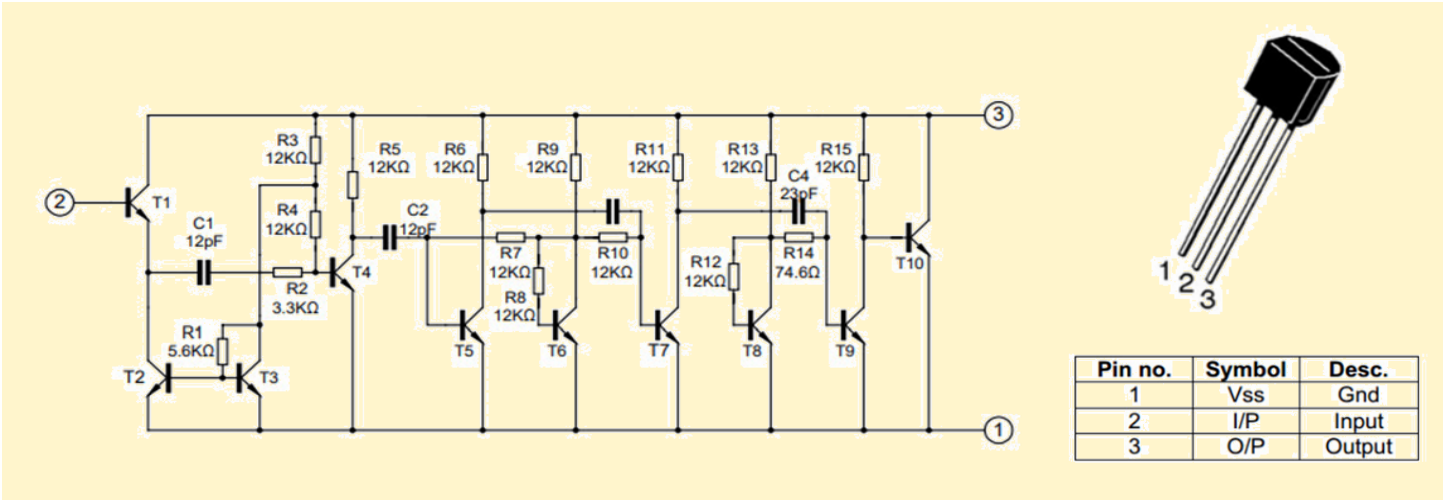
*In May 2022 CD7613 could be bought for C\$5.80 for 5 pieces, shipping and taxes included.*



Just as a curiosity, I include here the integrated circuit MK484, also found in its version TA7642. It is a direct amplification and detection AM receiver.

It does not work well for its designed purpose. When correctly biased for a particular station it is not correctly biased for

another station which is slightly stronger or weaker. People (including me) tried to make all kind of ham receivers, including regenerative. But the IC does not give enough inside access to make a regenerative schematic. It looks like a transistor, and this is what it has inside:



I lost too many hours trying to make something ham radio related with it and failed - like everybody, except for those who even made it work in the 40 meter band, at least in their articles, but never in a YouTube video - I will not give further price details about this IC.

This article tried to provide a short review of what it is still available today from what an older ham probably knows and loves from past radio ICs. The prices give an indication that starting now, in 2022, a new project

with those incredible old ICs can still make sense (MC1496 is from 1970s, is some 50 years old; the ONSEMI datasheet for it is from 2006 and the Motorola datasheet is from 1996. Most probably it is still in production in China.)

~ Daniel VE7LCG



## A Good Use of an Old Baofeng HT

Frank M. Howell K4FMH

The old Baofeng HT (UV5R) is the butt of many jokes these days in amateur radio. But right after their introduction, they were the “Xiegu HF rig” of the moment: they mostly worked, were cheaper than many similar products, and hams just had to explore them!

I bought a few, kept one, but gave them to new hams. Heck, I even purchased a *case of Baofeng’s* to supply the [new amateur radio club](#) in my home county of Washington County, GA. They would charge them up, program them for the new repeater, and gift them to newly licensed Techs in Sandersville and thereabouts.

What happened to the one I kept? Well, if you have a minute, here it is.

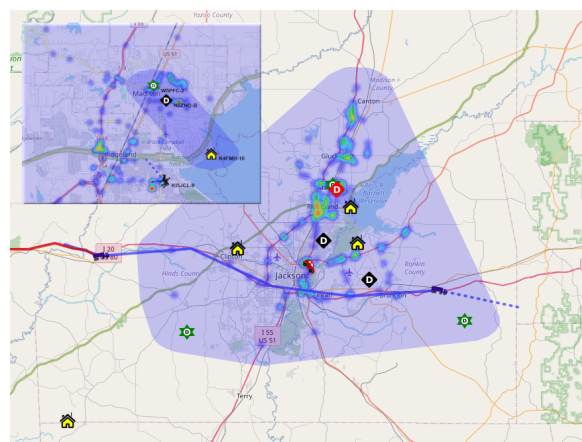
The Jackson MS area had fallen by the wayside in terms of APRS digipeaters. But it really sucked by not having any iGates. A fellow ham who was head of Security at an area hospital installed an iGate serviced by backup power as part of their EmComm effort. That was fine... until the IT team monkeyed with “odd” IP connections and just cut Internet service to it periodically. The turnover in IT kept the Security Head (the ham) busy renegotiating service behind their firewall. So he eventually got them to put it on the guest WiFi sector and it’s been serving the area reliably ever since.

But N5DU and I led the effort to add more digi’s in the greater Jackson area, donating ones to the Vicksburg Club, a tower east of us that the manager (also a ham) gladly installed, a node at a nuclear power plant at Port Gipson, and one down I-55 South near Crystal Springs. But only one iGate to serve them really got in the way of educating the other digi managers to configure the right number of “hops” to effectively get to an iGate.

So I used my remaining Baofeng HT with a small footprint PC (Dell OptiPlex 160 Tiny Desktop, bought for \$40 shipped via eBay) and a [software modem](#) to create a second iGate in my home (K4FMH-10). As the picture from [APRS Direct](#) above illustrates, it’s in the large footprint of the JARC digi installed on a water tower in Madison, MS to the NW of my QTH on the Barnett Rez. (See inset of my iGate’s estimated footprint by APRS-Direct. No, *KI5JCL-9 isn’t riding a horse*. He just has a sense of humor!)

It’s stored in the bottom of a built-in cabinet in my small library / printer closet adjacent to my 2nd floor office.

*APRS-Direct visualization of APRS system in Jackson, MS area (inset shows K4FMH-10 iGate footprint).*





It's 3 miles from a nearby APRS Digi maintained by the Jackson ARC (my friend N5WDG maintains their repeaters and other digi devices). And, it sits in the supplied Baofeng charger. For over 2 years, working faithfully. Until it didn't. And that's the focus of this story.

The higher power battery is a slim-line model. I thought that would be good for this little iGate-robot. [See the picture on the left.] And it has been.

Bobby KG5TGT later added a 2-way iGate to the Southwest of Jackson. It covers several Digipeaters on that side of town: the JARC's 2nd digi on a broadcast tower, Vicksburg's Digi (that N5DU and I donated), and the monster on a tower at the nuclear power plant outside of Port Gipson. FB all the way!

#### Until this happened.

Yep, over a day's period, the 2 year-old high power battery (Baofeng marketing-speak) hit it's outer charge limit and expanded several times over the slim size that it was... well, the day before!

All this happened while I was in a recording session for the [ICQ Podcast](#). Unbeknownst to Martin M1MRB and my fellow Presenters, I simply ordered a replacement on Amazon that was delivered in 2 days. The K4FMH-10 iGate was back shipping packets into the APRS network.

The moral? Oh heck. Just check your batteries periodically. While I thought I had, this could have produced a fire. Fortunately, I'm in that small room every day for various things and I look at

the iGate system. But this expansion occurred over a 24-hour period. I should take steps to create a more robust iGate unit. *But that might mean I'd become Baofeng-free!*

Do you have a Baofeng lying around, getting no use? Find a way to put it to some good. But do check the battery from time to time.

~ Frank K4FMH

Reprinted with the author's permission. Read his blog at [K4FMH - A blog about amateur radio ...](#)



K4FMH-10 iGate working away to "gate" just the packets from the W5PFC-1 Digi some 3 miles away.

Below: Baofeng battery expanded rapidly!



Frank M. Howell is Professor Emeritus at Mississippi State University and Adjunct Professor at Emory University. He has been an SWL, avid BCB DXer, and antenna builder since he was 8 years old. At age 20, he led the construction of two radio stations; one FMer at Georgia College (WXGC) and the other a commercial AMer (WXLX) in Milledgeville, holding a Third Class FCC Radiotelephone License. Frank served as News Director and AP Bureau Chief at WXLX before attending graduate school and pursuing a career as a college professor, teaching at Texas Christian University, North Carolina State University, Mississippi State University and Emory University. He served as Senior Policy Analyst at the Board of Regents Office for the University System of Georgia in Atlanta, finishing his career as Editor-in-Chief at Springer Media, a large scientific publisher in The Netherlands. Frank obtained his amateur

radio license at 58 in 2010. Originally assigned KJ4QJZ, his call sign is K4FMH. Frank lives in Ridgeland, a northern suburb of Jackson, MS, on the Barnett Reservoir.

Frank has been active in ham radio organizations since receiving his call sign. He is a Life Member of the ARRL and Assistant Director of the ARRL Delta Division, having served under two Division Directors. After being licensed at the Georgia Tech club, he joined the Atlanta Radio Club, assisting with club programs. Frank served as ARES Emergency Coordinator in Starkville MS. K4FMH has been Vice President of the Central Mississippi Amateur Radio Association in Brandon and President of the Magnolia Amateur Radio Club in Starkville. He launched the Magnolia Intertie Inc. non-profit organization with Mike N5DU. Frank is the Trustee for the KG5FCI call sign for that group of repeaters.

Frank is a Presenter on the ICQ Podcast and has been co-Host of the QSO Radio Show on WTWW with Ted Randall

and of the Amateur Radio Roundtable on WBCQ and w5kub.com with Tom Medlin. He frequently gives talks in person and by Skype to amateur radio groups. Frank blogs at k4fmh.com, sometimes with a focus on the sociological aspects of the past time that is amateur radio. He is a regular contributor to the Amateur Radio Newsletter at amateurradio.com. He also publishes complementary research and information at FoxMikeHotel.com.

K4FMH enjoys most aspects of ham radio, especially tests and measurements on his workbench, rag chewing on HF, portable operations, digital modes via repeaters (DSTAR, Fusion, DMR), and the occasional DX contest. But he looks forward to learning that next new thing...

We hope to publish more of Frank's articles in the future.

~

## Yet another iambic electronic keyer

[GitHub - MarkWoodworth/xiaokey](https://github.com/MarkWoodworth/xiaokey)

It is a minimalist device based on: an inexpensive Seeed [Xiao](#) RP2040 controller board [CircuitPython](#) programs and libraries The code directory has the files to be installed on the *Seeed Xiao* device. The pcbdirectory has the Eagle schematics for a possible carrier board with connectors.

### Features

- Operates as an [iambic type B](#) Morse code keyer with a 3.5mm stereo jack to connect to a dual-paddle telegraph key
- Has a configurable side tone transmitted through an on-board piezo buzzer
- Has an open-drain output to a 2.5mm mono jack, which should be able to key most radios (probably not tube sets)
- When connected to a PC over USB appears as two COM ports:
- One is the *CircuitPython* REPL and console
- A second port that shows the characters being transmitted, and also transmits Morse code for characters typed into the COM port
- Has three buttons to trigger canned messages
- Speed, sidetone, keyboard operation, and canned messages are configured by editing the code.py file on the *CIRCUITPY* device
- Can act as a USB keyboard, where keyed characters are also sent to the computer as keystrokes.



# From The WOBTV Repeater



Jim Andrews KH6HTV

## Analog TV is still alive!

It can be ordered on-line. While recent issues of this newsletter have moaned about the demise of analog ATV gear, all is not lost yet.

We have written previously about the availability of really great FM-TV gear for the amateur 5.8 GHz band. It is still available, and dirt cheap !

Go to Amazon.com and search for "RC832 & TS832" This is a matched set of a 600 mW transmitter and receiver. The amazing low price is only US\$ 30 and Prime shipping has it on your door-step the next day. Both units feature built-in frequency synthesizers for 40 channels. Many of which fall into our 5.8 GHz band.

The TS832 transmitter comes with a built-in tiny microphone mounted on the pc board. Bill, AB0MY, has discovered how to disable it, and instead insert line level audio from your camcorder, DVD player, etc. For details, see our previous ATV newsletters, issues #27 & 29.



The Boulder, Colorado, ATV repeater, WOBTV, includes an FM-TV transmitter on 5.905 GHz. It is using the TS832 transmitter, plus a 2 watt power amplifier driving a 10dBi, omni-directional, horizontally polarized antenna. For details, see past issue #58 of this newsletter. In field tests, we have confirmed reception of this FM-TV beacon signal out to at least 70 miles.

In other field tests using the TS830 & RS830 combo along with the L-Com BBQ grill antenna, Bill, AB0MY, and Gary, WB5PJB, exchanged live P3 color pictures with audio over a 53 mile path.

So, analog TV is not dead yet - plus you can do it quite inexpensively. Give it a try!

### 70cm AM-TV Exciter & Demodulator

As long as we are on the subject of the issue of analog TV and the difficulty in obtaining gear these days, let's not forget some items from China which ATV hams have discovered.

Back in 2020, Burt, N7CS, discovered the HLLY brand, model TVX-50, NTSC TV transmitter. We reviewed it in our ATV newsletter issue #45. It was useable on the ham 70cm band, producing AM-TV, not VUSB-TV. The only issue we found with it at



the time was deceptive advertising. It was advertised to be a 0.5 Watt transmitter and we found that it was really a 30 mW transmitter.



But it certainly could be used as an exciter driving a higher power, linear amplifier.

We have just googled it and find that it is still being advertised for sale on eBay from China for about US\$ 110. The only difference now being the model number is changed slightly to TVX-50M and they advertised the output power to be 50 mW.

Also a quick Amazon search for "NTSC Demodulators" came up with this one. It tunes CATV channels 2 thru 139, thus including channels 57-61 in the ham 70cm band.

Amazon prime price is US\$ 85. We have not personally tested this item, so can not vouch for it. But looks promising.



So, you die-hard, NTSC, analog ATVers out there, get out and buy some of this stuff coming from China. Check it out. Then write up reviews of what you find, and we will publish them for the benefit of our readers.

~ Jim KH6HTV

Reprinted with permission. The Boulder Amateur Television Club TV Repeater's REPEATER newsletter July, 2022 2ed edition, issue #106

BATVC web site: [www.kh6htv.com](http://www.kh6htv.com)

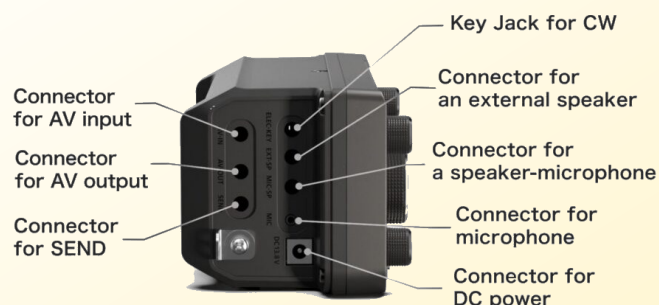
All past issues are archived at: <https://kh6htv.com/newsletter/>

## The new Icom IC-905 microwave radio

This new unit features bands at: 144 / 430 / 1200 / 2400 / 5600 / 10 GHz and in modes: SSB, CW, FM, AM, RTTY, DV/DD, ATV. There is a video at: <https://www.youtube.com/watch?v=kzGQWmTKNzc>

Jim Andrews KH6HTV points out that ATV mode is demonstrated at around the 4min 30sec mark. "The IC-905 is compatible with ATV in the FM mode. If an analog camera is connected, the IC-905 can transmit and receive video and also supports enlarged display of the video." You don't need to use expensive long runs of low-loss coax for this radio. It uses ethernet cabling to run to a mast-mounted RF module that then uses a very short run of coax to the antenna to limit losses.

Aside from the ATV hobbyist function, this could be a real feature for emergency preparedness and site reports.~





# Ham Hardware

John Schouten VE7TI

## *A very capable \$6 digital power supply*

Likely you have read countless articles on using discarded computer power supplies for amateur radio use. The ones I have read often involved circuit changes to add a load resistor and other 'fixes'. I have done this in the past and found that they did not meet my needs and did not perform adequately for transceiver demands. Radio frequency interference was also an issue if it was used near HF receivers.

Quite by accident I stumbled upon a circuit board on [Amazon.ca](https://www.amazon.ca) while shopping for parts for another project. Labelled as a 24-Pin ATX Benchtop Power Board Computer Power Supply Breakout Adapter, it was less than C\$ 12 for two boards. They are bare boards with no stand-offs or case and offered separate outputs of +12, -12, 5 and 3 volts via well-labelled binding posts.



There is an on-off slide switch and a power LED. I honestly did not really think I needed one, let alone two, but at this price I thought it worth the purchase just so I could share

the experience with you. By the way, I passed on the opportunity to buy the same two boards for C\$ 49 in the next ad down.

The boards arrive surprisingly fast, only about 3 days after placing the order. The board was reasonably clean and well made. Lacking was the quality of the fuse holder clips and the binding posts. The fuse clips had been bent in transit and I was able to bend them back to shape without much fuss. They are fairly thin metal though, and I may have to replace them at some point. I wrote back to the vendor about this and was promptly credited back half my purchase price. As an aside, this is one reason I have started to use Amazon for many of these purchases. I used to use eBay but I was often dissatisfied with the quality of the goods and the very long shipping times... if the merchandise arrived at all. Amazon has never failed me. The binding posts are useable but not the quality that I would use in my own projects. You get what you pay for and neither the clips or binding posts were significant issues at this price.



I had two power supplies from discarded computers. One an HP with very high current capability and the other a no-name Chinese product from an ancient

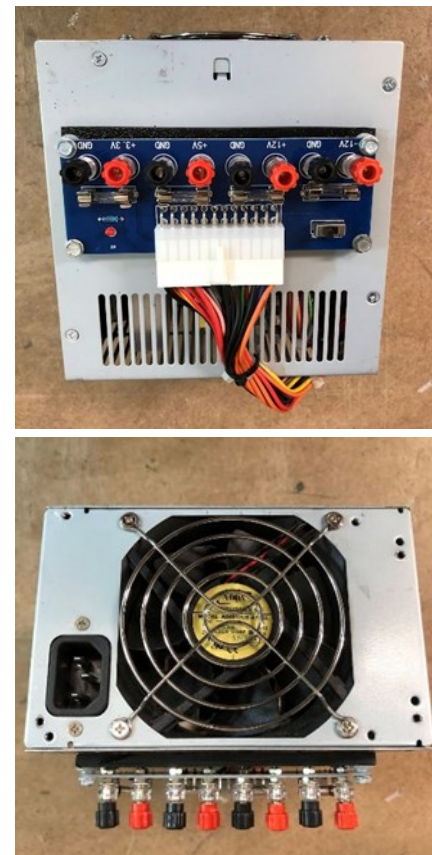
Dell. The HP promised 5 volts @ 19 Amps, 3 volts @ 24 Amps, +12 volts @ 14.5 Amps, and -12 volts @ 0.15 Amps. A second 5-volt supply was rated @ 3 Amps. I cut off any wire that did not connect to the 24-pin main plug. I also cut a spare piece of black Lexan to insulate the bottom of the board from the power supply chassis. I mounted the board with some plastic washers and self-tapping screws. I considered rebuilding the entire unit into one case but as is, there are no dangerous voltages outside the power supply housing so I did not see the need for the extra work.

The moment of truth! I first checked the various voltages with my meter. You just never know with these things and some sub-standard Chinese engineering practices. Everything checked out.

I soldered up a PowerPole pig-tail, and selected my oldest transceiver for the test. Everything worked as it should. 12 Amp draw on high power transmit and no noise on VHF. Next, I connected my HF rig. Again, no problem on transmit at 50 Watts and surprisingly, no RFI and no excessive heat.

I'm not certain if I will ever use these supplies to power my transceivers long-term. I prefer a deep-cycle AGM battery and a good battery maintainer for my everyday shack needs. I did need a bench supply though and, having these three voltages should meet all my experimenter needs.

~ John VE7TI



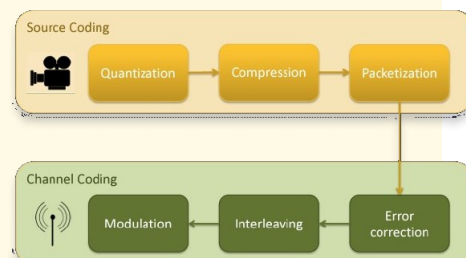
Daniel VE7LGC described a similar project in the September-October 2020 Communicator, without the use of an external module, but with more cutting and soldering. You can read it [here](#), starting on page 36.

## Want to learn a lot more about the internal workings of DVB-T ?

Go to Matt Holiday K0DVB's website: <https://k0dvb.org/television/atv-training/> and down-load his .pdf file on DVB-T Training - Part 2. Matt was the Boulder County, Colorado, ARES (BCARES) ATV guru and coordinator for several years.

He gave several training classes on ATV to BCARES members. For his classes, he developed some excellent power-point slide presentations. workings of DVB-T. This particular lecture dug deeply into the internal workings of DVB-T.

~ The Boulder Amateur Television Club TV Repeater's [REPEATER newsletter](#), August 2022, 3ed edition, issue #109







## Thoughts from the Shack

Solomon Singer NH7ZE

### *Cleaning corroded wires*

Here is an old ham radio operators trick for cleaning wires for soldering that are old and corroded. It is hard to find this technique printed anywhere! I am a ham, NH7ZE, and learned it from my elmer (mentor). I am passing it on. I hope it helps people who need to clean wires:P Please vote!!!

Normally, if you strip a wire, and see it is corroded, there is not much you can do to restore it's shiny new conductive properties. There is scraping and scratching which comes to mind, but you'll never get it to the solderable slickness it once was long ago. After laboring and fretting over the corroded pieces of wire for a long, long time, you see that your sweat coming out of your palms and fingers are corroding the copper AGAIN!!!! Oh, dear. NOT TO WORRY!!!! Give yourself a pat on the back, because what you will pull out of your bag of tricks now, will send all the corroded copper wires

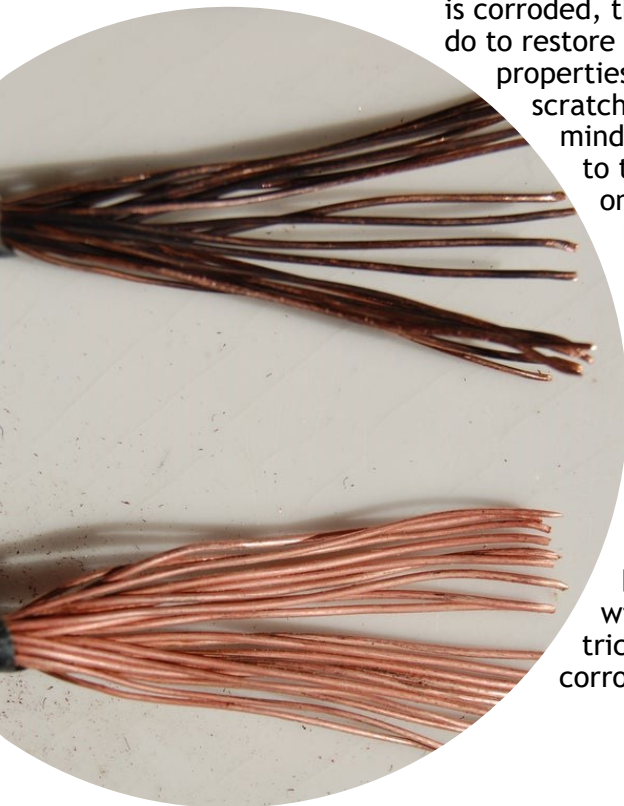
scurrying and scampering away in fear!!!! Here is how to clean any corroded wire without even touching it, in 30 seconds!! And what's more, you can even solder it!!!

This process uses two solutions, one is regular table salt and vinegar. Any kind of vinegar will work, from balsamic, to rice, to white vinegars. Its the acidity and corrosiveness of the salt and vinegar together that you want. The other solution is Sodium Bicarbonate, or baking soda, and water. This is used to neutralize the corrosive properties of the other solution, and to further clean the wires.

**Step 1:** Strip the wires to be cleaned.

**Step 2:** Get 2 containers, one for each solution. They can be paper cups, plastic, glass, bowls, whatever you can find. I have vials, because I am a professional electronics installer and I use these solutions out in the field.

**Step 3:** Get 1 tablespoon of raw salt, and put it in one of the containers. Fill up the rest of the container with vinegar, and stir the both together. As a general rule of thumb, put as much salt in the vinegar as will dissolve.



**Step 4:** Get 1 tablespoon of Sodium Bicarbonate, (baking soda) and add it to the other container. Fill up the rest with water, and stir well. Add more baking soda to make it cloudy. The amount is not important, as long as it is alkaline to cancel the acid of the vinegar solution.

**Step 5:** Put the stripped end of the wire in the vinegar solution, and stir the solution with the wire. any wire you want cleaned needs to be under the solution. Movement of the wire in the liquid speeds up the process.

**Step 6:** After 2 minutes or so, the wire will look very shiny and new in the vinegar solution. The acid and salt in the solution is etching away the oxides, exposing the bare metal. Make sure the metal is uniformly shiny. Leave it in longer if it is not perfectly clean throughout.

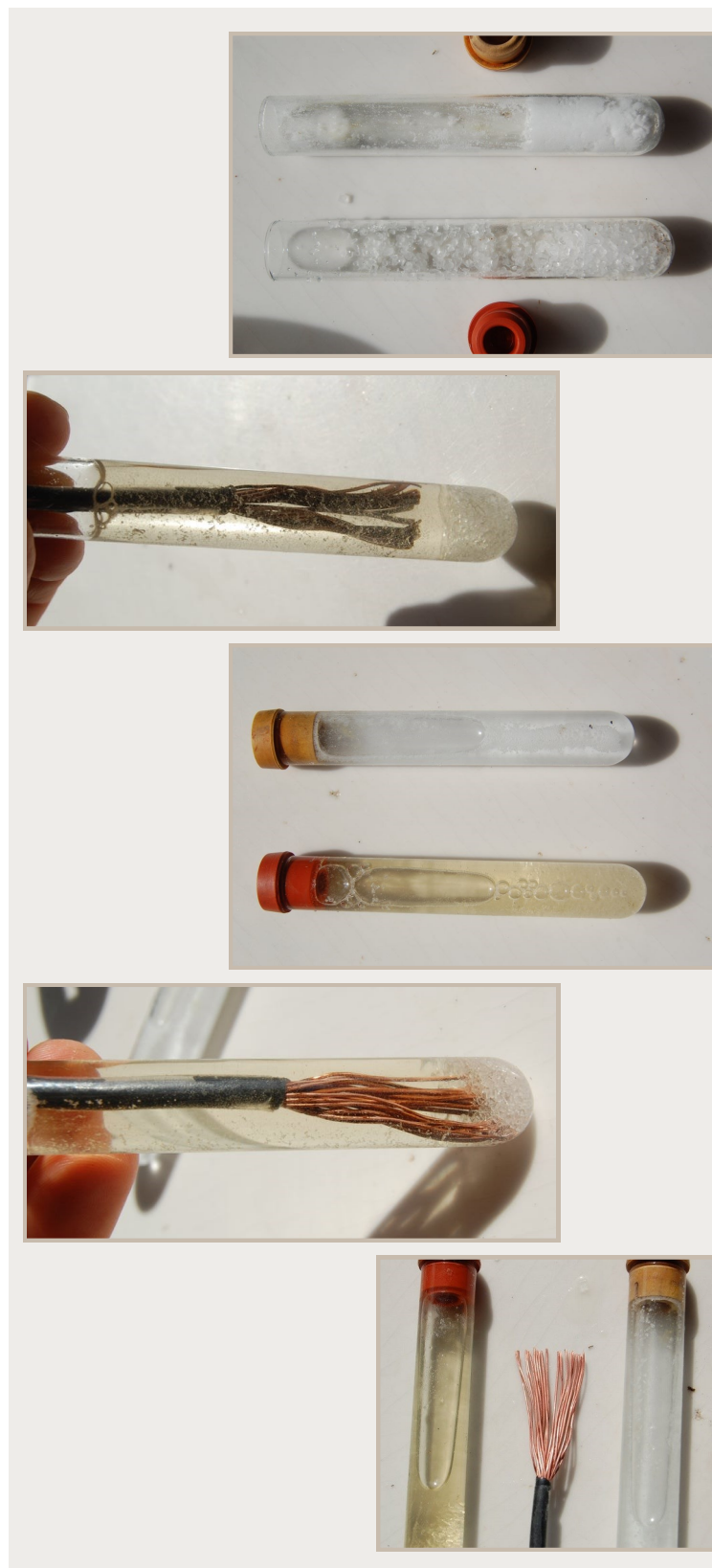
**Step 7:** Once the wire is satisfactorily clean, remove the wire from the vinegar, and plunge it into the baking soda solution to neutralize the acid's corrosive properties. If the wire was exposed to the air, without neutralizing the acid first, it would quickly corrode again. The baking soda keeps it clean and shiny. Swish the wire around in the baking soda water for about 10 seconds, and then you are done!! Shiny new wire ready for soldering, and conducting once again!!

Thanks for reading,

~ NH7ZE

<https://www.instructables.com/member/solo-monhorses/>

[How to Perfectly Clean Wires in Minutes!!! - Instructables](#)



## TECH TOPICS

...more

FV Filippetti LU2ARZ

### Tape measure antenna efficiency

By now, the tape measure Yagi has been written up in many Amateur Radio publications and websites. The antenna works well and I have used it for satellite contacts and other purposes where a thin, flexible antenna, that folds easily without damage, is required. I came upon a blog site that takes exception with this antenna's efficiency:

*I have corrected some obvious translation errors, but LU2ARX writes:* After spending some time searching for a DIY friendly portable antenna for my Baofeng, I came across a measuring tape antenna that has all the benefits I was searching for: foldable (particular importance at VHF), cheap, DIY friendly, good reviews, etc. But something made some noise in my head that impeded me immediately—that being skin-effect.

Skin effect is the interaction between the variable magnetic fields generated by the current circulating in a conductor and its same current. the effect is detrimental because magnetic fields tend to interact negatively with charge carriers generating a net force that pushes them outwards, thereby reducing the effective conducting area of the conductor. This phenomena was studied extensively on round conductors (one of the best cases) and because of the geometry of this particular problem, the charges distribute uniformly over the perimeter of the conductor.

Some conductors don't have the same luck, for example a rectangular bar carries most of the charges on a really small part of its cross-section, this way the electrical resistance at high frequency will be much higher than the DC counterpart.

Tape measure antennas suffer from this phenomena the same way as the last example but with an added disadvantage: they are made from a carbon-iron instead of copper. This brings two new problems to the table: First, DC resistance will be an order of magnitude higher, and second the magnetic permeability of iron worsens the magnetic field inside the conductor in respect to skin effect.

His suggested solution: copper electrolytic plating. Plating tends to accumulate over sharp edges and this phenomena is beneficial because on edges of the tape is where most of the current flows.

If you want to know more, read the full article, with diagrams, at:

<https://fvfilippetti.wordpress.com/2022/08/13/measure-tape-antenna-efficiency/>

Is the lesser skin effect enough to forego the use of this antenna as is? Not for me... if I can work satellites with them the advantages outweigh the disadvantages.

~ John VE7TI





# Ham Radio outside the box

# VA3KOT

John Corby

## *Vertical Antenna Redesigned*

I have posted before about my DIY vertical antenna. It is a rapid deployment antenna that has served faithfully for several POTA activations. But, recently I came to realize it wasn't meeting my needs for all three ways in which I needed to deploy it. Time for a redesign!

My vertical antenna is a centre-loaded unit with three use cases:

1. Mounted on a hitch mount on my truck . This mount is not intended for mobile use; the antenna is not ruggedized for high speed motion. But, where deployment in a paved parking lot is called for, this mounting method allows the truck chassis to serve as "the other half" of the antenna
2. Mounted on my "Wireless Wagon" (a lightweight hand cart). Where it is necessary to move equipment a moderate distance over grassy or unpaved terrain the Wireless Wagon becomes extremely useful. It provides rapid deployment antenna support and radial connection points without any penetration of the ground being necessary.

3. Mounted on a trekking pole for pedestrian mobile operations. If equipment needs to be backpacked over rough terrain, a modified aluminum trekking pole can support the antenna. The pole can be handheld or pushed into the ground.

In all three use cases the common issue is providing a convenient path to ground. A vertical antenna is usually a quarter wavelength long and needs another quarter wave element to provide "the other half". My preferred method of providing the other half - when operating a temporary outdoor station - is ground mounted radial wires.

In use case 1, the truck hitch mount provides a capacitive path to the truck chassis and no other radials or counterpoise are required. In use case 2 the aluminum frame of the Wireless Wagon provides a ground path to the radial wires. In use case 3 the aluminum trekking pole provides a ground path to the radial wires (or a drag wire).

*Use Case 1: Truck hitch mount*







The original antenna design employed a plastic Schedule 40 threaded connector to isolate the antenna driven element from ground. A single counterpoise wire provided “the other half”. The counterpoise wire was attached to the barrel of the coax connector by a large alligator clip while the coax centre conductor was connected directly to the antenna driven element.

In the redesign this arrangement was replaced by three concentric tubes. The inner aluminum tube is the driven element while the larger diameter outer aluminum tube is the ground connection. Each conductive tube is insulated from the other by a short section of 3/4 inch Schedule 40 PVC tube.

Now, the coax centre conductor is connected to the antenna driven element by a very short wire while the coax shield is directly connected to the outer, grounded tube. This arrangement provides a direct conductive path to ground in all three use cases.

The redesigned vertical antenna has already proven successful in the truck hitch mount and Wireless Wagon use cases. Maybe this redesign will stick around, or maybe not; I do like to tinker with new ideas so who knows!

~ John VA3KOT

Left: Use Case 2: “Wireless Wagon” mount; Centre: Use Case 3: Trekking pole mount; Top right: Old design – not very satisfactory!; Bottom right: New design – much tidier!

John VA3KOT resides in Owen Sound, Ontario but is more often found operating CW out in the “Big Blue Sky Shack”. He especially enjoys activating parks for the POTA program and blogging about his experiences at [HamRadioOutsidetheBox.wordpress.com](https://HamRadioOutsidetheBox.wordpress.com)



## *SOTA 23 cm QSO with N00Y*

While planning for the 2022 Colorado 14er Event, I decided to focus on making some long-distance contacts on 1.2 GHz (23 cm). Last year, Dave/W0ADV and I worked summit-to-summit (S2S) at a distance of 244 km (152.6 miles), which is my best result so far. See my previous post here...

For this year's event, I wanted to beat that distance so I checked in with the usual SOTA activators that use the 23 cm band, wondering if any of them would be on summits that would support such an effort. I was thinking in terms of another S2S contact using portable FM handheld radios. I identified a few summits in the San Juan mountains that might work, from Pikes Peak or Mount Evans. Also, northern New Mexico has some potential summits, but I did not find anyone interested in activating them.

Knowing that Lauren/W0LD has done quite a bit of VHF/UHF operating from Pikes, I figured he would have some insight concerning summits that are workable from Pikes. We connected via telephone and discussed some options. In that conversation, he suggested I reach out to two hams that have serious 23 cm stations in Kansas: N0LL and N00Y. This shifted my thinking away from S2S contacts to working a UHF station out on the plains. (Kansas has a noticeable lack of SOTA summits.) Pikes Peak (W0C/FR-004) is well-suited to this approach, being easy to access with a road to the top and an excellent radio horizon to the east. I sent an email to Larry/N0LL and Pete/N00Y to see if they were available. Larry replied that his 23 cm gear was currently

*Bob maintains a great blog site at <https://www.k0nr.com/wordpress/>.*

*Contact Bob at [bob@k0nr.com](mailto:bob@k0nr.com).*

*You can also check out his book [VHF, Summits and More: Having Fun With Ham Radio](#).*

*Bob/K0NR sitting down on the job on Pikes with the ICOM IC-9700 and Comet CYA-1216E Yagi antenna. (Photo: K0JJW)*



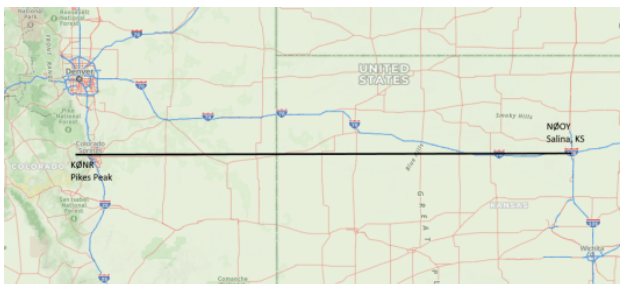




The N00Y station deserves the name "antenna farm".  
(Photo: N00Y)



The N00Y 8-foot dish  
antenna at 45 feet.



N00Y (EM18ct) is straight east of Pikes Peak  
(DM78lu), 628 km (392 miles).

off the air but Pete said that he was available to give it a try.

The distance from Pikes Peak (W0C/FR-004) to N00Y is almost 400 miles, so the FM handheld radio approach was probably not going to work. My ICOM IC-9700 was the way to go, with 10 watts of RF power to a

Yagi antenna. Pete used an ICOM IC-705 to drive a transverter that supplies 50 watts of RF to an 8-foot dish antenna at 45 feet. I chuckled when I heard this because the IC-705 is a popular SOTA rig...just not usually found on 23 cm.

Joyce/K0JJW and I made it to the summit a bit early and immediately set up for the 23 cm attempt. Normally, we operate on the west side of the summit, away from the visitors center and most of the tourists. For 23 cm, I wanted the best shot possible to the east, so we walked over to the boardwalk on the north side of the summit. It sticks out

enough to give an excellent view due east.

Once I was set up, I sent a text message to Pete asking him to start transmitting my direction on 1296.1 MHz. We had agreed to start with CW, our most efficient mode,

and perhaps later try SSB. He started with a series of CW dashes and I could easily pick up his signal. Joyce pointed the antenna for me, finding the best direction to peak the signal. Pete's signal was not terribly strong, but solid copy, only a few dB above my noise floor. Because he was running more power than me (about 7 dB), I was concerned that he would not be able to hear me. I called him using CW and initially, he did not respond. We kept trying and my signal came up a bit at his end and we were able to complete the contact. Conditions were marginal enough that we did not try SSB. (Sorry, Joyce missed out on this one...she doesn't work CW.)

### **SOTA Requirements**

Although we drove to the summit of Pikes Peak, we made sure we were SOTA compliant. Our normal approach on a drive-up summit is to load up our backpacks with a portable station and hike some distance away from our vehicle. My IC-9700 is not exactly a compact transceiver but it is portable enough to transport some distance and it can be powered using a small Bioenno battery. I've carried this size radio (often an FT-991) on other SOTA activations, hiking a mile or two with it. It certainly adds weight to my pack, but it is manageable. The antenna was a Comet CYA-1216E, about 5 feet long, with 16 elements and a specified gain of 16.6 dBi.

So this is my new personal best for 23 cm SOTA: 628 km, 392 miles. My thanks go to Pete/N00Y

for getting on the air and giving this a try. His station was doing more than half the work with this radio contact. I've done SOTA QSOs like this with other weak-signal VHF/UHF operators. They may not be active SOTA chasers but they like the challenge of completing a difficult contact. I really appreciate them getting on the air with me. It's all part of having fun messing around with radios.

This raises the question of what's next?

Maybe I can get N00Y to move his station another 50 km to the east for another attempt. Probably not.

Stay tuned.

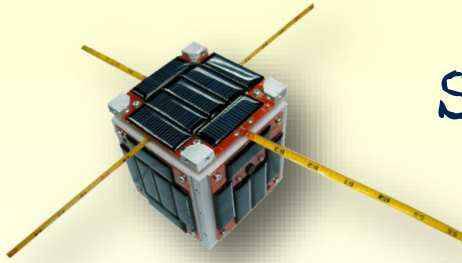
~ Bob KØNR



The weak KØNR CW signal just barely showed

*This book is an easy-to-understand introduction to VHF/UHF ham radio, including practical tips for getting on the air and having fun messing around with radios. Learn about FM, SSB, repeaters, equipment, band plans, phonetics, portable operating, Summits On The Air (SOTA) activations and more.*





# Satellite News

NASA's upcoming Artemis I mission

## *Unpacking the stowaway science aboard Artemis I*

NASA's upcoming Artemis I mission represents a critical milestone on the space agency's path towards establishing a sustainable human presence on the Moon. It will mark not only the first flight of the massive Space Launch System (SLS) and its Interim Cryogenic Propulsion Stage (ICPS), but will also test the ability of the 25 ton Orion Multi-Purpose Crew Vehicle (MPCV) to operate in lunar orbit. While there won't be any crew aboard this flight, it will serve as a dress rehearsal for the Artemis II mission — which will see humans travel beyond low Earth orbit for the first time since the Apollo program ended in 1972.

As the SLS was designed to lift a fully loaded and crewed Orion capsule, the towering rocket and the ICPS are being considerably underutilized for this test flight. With so much excess payload capacity available, Artemis I is in the unique position of being able to carry a number of secondary payloads into cislunar space without making any changes to the overall mission or flight trajectory.

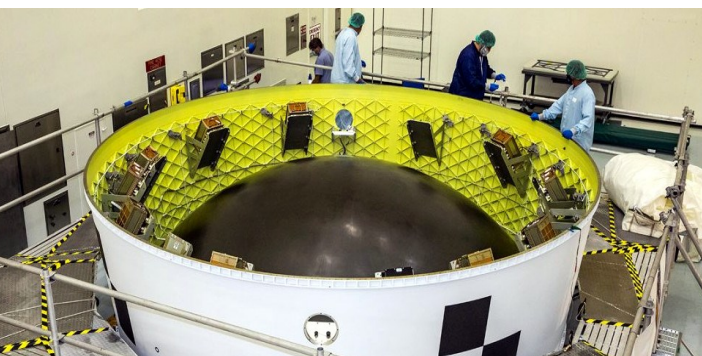
NASA has selected ten CubeSats to hitch a ride into space aboard Artemis I, which will test out new technologies and conduct deep space

research. These secondary payloads are officially deemed “High Risk, High Reward”, with their success far from guaranteed. But should they complete their individual missions, they may well help shape the future of lunar exploration.

The CubeSats along for the ride are in no way, shape, or form, a priority for NASA or Mission Control. While everyone would like to see them succeed, no special treatment or consideration will be given to these craft. If a decision needs to be made that will save the Orion at the expense of the secondary payloads, there's no question which way it will go.

To prevent any possible interaction with the primary mission, the CubeSats won't even be deployed until nearly two hours after Orion has separated from the ICPS. Once the capsule has moved a safe distance away, the small satellites will be sequentially released from angled dispensers mounted to the inside of the stage adapter.

Read the full article on [Hackaday](#)



Here is a list of frequencies for all the amateur (and NASA) transponders and beacons used in the Artemis mission.

Many of these signals will be receivable with a cheap SDR dongle and a Yagi or small dish.

The URL is <https://sgcderek.github.io/blog/artemis-1.html>



## *Simultaneous APRS and Voice Repeater on the International Space Station*



ARISS, Amateur Radio on the International Space Station, announced that simultaneous operations of the ARISS Voice Repeater and digital APRS communications on the Space Station is now a reality. Current ARISS operations include voice repeater transmissions with the JVC Kenwood D710GA in the Columbus module and APRS packet operation from an identical radio in the Service Module (Zvezda). Packet operations are on 145.825 MHz.

The ARISS Russia and USA teams have been working for several weeks to prepare the Service Module radio for APRS operations. ARISS Russia team member Sergey Samburov, RV3DR, led the effort, working with Russian mission controllers and the on-board ISS cosmonauts to configure the Service Module radio for APRS ops. On August 11, final checkouts were completed and the APRS packet mode was switched on for amateur radio use.

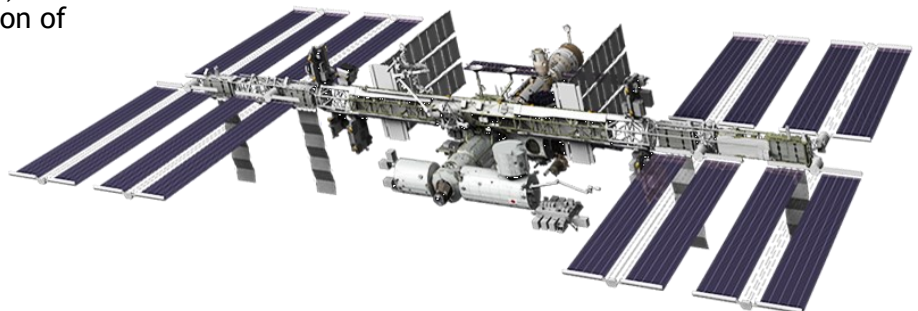
ARISS-International Chair Frank Bauer, KA3HDO, said, “Simultaneous operation of APRS and the voice repeater on ISS is transformative for ARISS and represents a key element of our ARISS 2.0 initiative, providing interactive capabilities 24/7 that

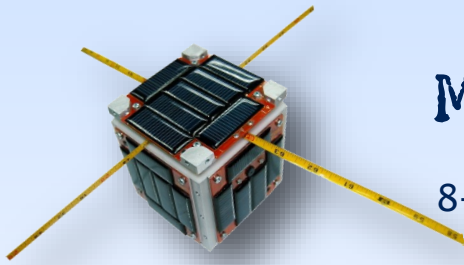
inspire, engage and educate youth and lifelong learners—especially life-long learning in ham radio operations. Our heartfelt thanks to Sergey Samburov, RV3DR, for making this crucial ARISS 2.0 initiative become a reality.”

The Columbus Module radio uses the call sign NA1SS and the new Service Module radio uses RS0ISS. Aside from the call signs, the radios are identical and packet operations are the same as before. Hams can use RS0ISS, ARISS, or APRSAT as the packet path. Also, both radios are expected to be on full time, except during educational contacts, EVAs, and dockings or undockings.

You can find operational status and expected downtimes of the ISS radios at <https://www.ariss.org/current-status-of-iss-stations>.

~





## More Satellite News

8-year-old Radio Ham

*ISS astronaut's favourite ham radio contact*

Several of our local SARC members have now had the opportunity to make contact with NASA astronaut Kjell Lindgren KØ5MOS, who is on the International Space Station. He describes his amateur radio contact with 8-year-old Isabella from Kent, UK, as his favourite so far

He tweeted:  
I've had a lot of fun using the #ARISS amateur radio station #NA1SS on the @Space\_Station to talk with ham radio operators all over the world. I've even (unofficially) worked stations on all continents! But this may be my favourite contact so far. Thanks Isabella and @m0lmk!

[https://twitter.com/astro\\_kjell/status/1554592817024040960](https://twitter.com/astro_kjell/status/1554592817024040960)

Matt MØLMK had tweeted:

On April 23, 2016, a 2-year old sat on my knee and watched the students of Wellesley House school chat with @astro\_timpeake, an event I helped organise. Today, August 2, 2022 she got her chance. Thank you so much @astro\_kjell, you have changed her world.

<https://twitter.com/m0lmk/status/1554561621640585224>

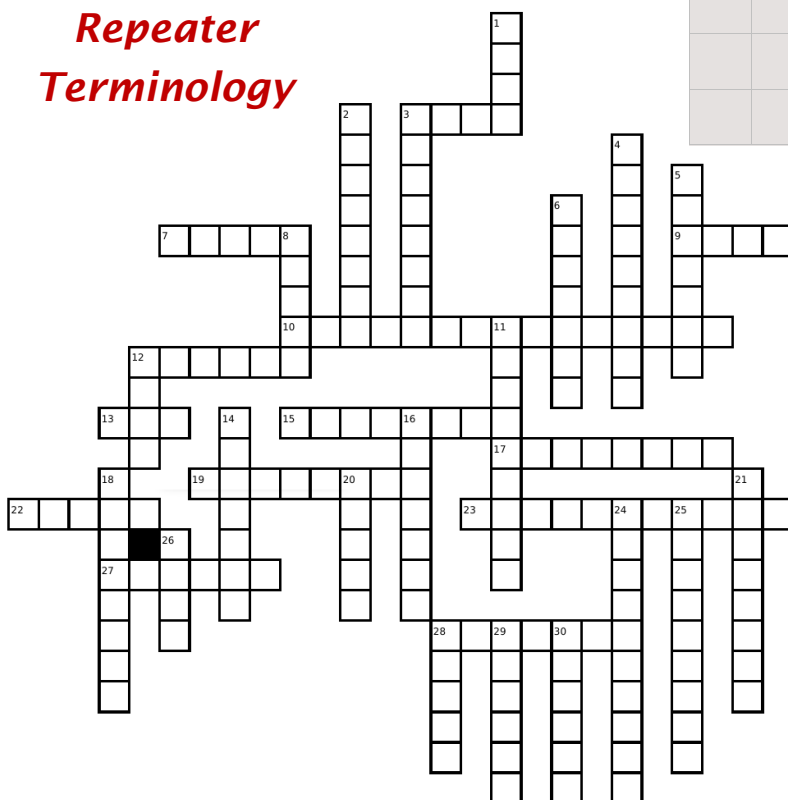
A recording of the contact is at  
[https://www.m0lmk.co.uk/wp-content/uploads/2022/08/Isabella\\_ISS\\_Contact\\_02-08-22.mp3](https://www.m0lmk.co.uk/wp-content/uploads/2022/08/Isabella_ISS_Contact_02-08-22.mp3)

Amateur Radio on the International Space Station  
<https://www.ariss.org/contact-the-iss.html>

~



## Repeater Terminology



### Down:

1. a duplex mode of communication in which a user transmits at one time and receives at another time
2. antenna with a magnetic base that permits quick installation
3. device that allows the repeater transmitter and receiver to use the same antenna simultaneously
4. slang term for a repeater time-out timer
5. Amateur Radio operator who is designated to regulate the operation of the repeater
6. a mode of communication in which users transmit and receive on the same frequency
8. the difference (in kHz) between a repeater's transmitter and receiver frequencies
11. a publication that lists repeaters
12. a word sometimes used to indicate the end of a voice transmission
14. the pair of frequencies (input and output) used by a repeater
16. an array of 12 or 16 numbered keys that generate the standard telephone (DTMF)
18. portable battery-operated transceiver
20. frequency of the repeater incoming signal
21. geographic area within which the repeater provides communications
24. regular CW repeater transmission of its callsign
25. device that interfaces a repeater to the telephone system
26. a repeater whose access is not limited
28. device that measures the length of each transmission and causes the repeater or a repeater function to turn off after a transmission has exceeded a certain length
29. call used to indicate distress
30. North American standard 600 KHz input/output difference

*Solution page 123*

### Across:

3. abbreviation for the series of tones generated from a keypad on a ham radio transceiver
7. abbreviation for a series of subaudible tones that some repeaters use digipeater, a packet radio repeater
9. a popular battery chemistry
10. distortion from unwanted mixing of two strong RF signals
12. the frequency of the repeater's transmitter (and your transceiver's receiver)
13. to turn on a repeater by transmitting on its input frequency
15. the short period following a transmission that allows others who want to access the repeater a chance to do so
17. an audible tone that a repeater user may go ahead and transmit
19. federally assigned repeater identifier
22. interrupt a conversation on a repeater
23. an individual or group responsible for repeater frequencies in an area
27. mode of communication in which a user transmits on one frequency and receives on another frequency simultaneously
28. timer to cause the repeater to turn off because you have transmitted for too long



# VE9KK the world of CW



Just taking a break from the WAE CW contest this morning (Sunday) and this contest has been an adventure! Issues with S.T.E.V.E (more about this after the contest in another post) and then Murphy showed up. A few days before any contest I get the PC, radio and N1MM+ contest logger going and make sure all is well, and it was.

Murphy had no issue waiting, I started contesting and things went wrong right at the get-go, as I was CWing "CQ CONTEST" a warning on my PC came up that I lost my internet connection. Then another message informed me my connection had been re-established. This just kept happening over and over and it was only when I was transmitting. This told me RFI was the issue, NEVER up until now have I ever had this issue but such is Murphy.

The contest at this point was a bit slow so I decided to investigate the issue further. I had a theory and that was my new PC motherboard has WIFI and uses two small antennas at the rear of the PC. I checked my settings and I was on WIFI, not LAN... so I thought. I removed the two small WIFI

antenna thinking that they would be good at picking up RFI and thus could be the reason. I then set my LAN as the internet connection.

After restarting my PC I was back to contesting but this time there was the loss of internet connection but not as often. Thinking now it was possibly my LAN hub at the rear of the PC. I then connected my LAN (with toroidal chokes) directly to my PC. Again I had intermittent connection issues and I was sure it was still the WIFI and maybe the antenna female connector ends on the PC motherboard were picking up RF still. The issue happened less often so removing the antennas did help.

It was not off to the BIOS to shut the motherboard WIFI down... going into the BIOS... what could go wrong here?? Once in the BIOS, I clicked here and there and just could not find any WIFI settings. Closed the BIOS and restarted the PC.

Once restarted I knew something was wrong, the PC was really slow and jerky is the best way to describe it. I went to the internet to see what the hell I had done only to find the internet now was running as if I was on dial-up!



I have now gone from intermittent internet connection to a funky PC and very slow internet speed. Oh, and I also noticed that in my contest program N1MM+ I lost the contest macro setup and all my contacts. I have no idea what that has to do with the BIOS but it happened.

After some reading on the internet on my laptop, I concluded the best thing to do was update the BIOS and MSI motherboards they make it very easy to do. My thought was, that whatever the heck I did will be undone by a BIOS update. After all, I have nothing to lose if I wanted I could reformat the hard drive and slide a backup clone image onto the drive from my backup files on another hard drive. I would have all my programs and setting from an earlier time. Some may think I could just use Windows system restore. In times of need, I have ALWAYS had system restore let me down with a final message after a restore that windows was unable to restore to an earlier date!!

The BIOS updated without any issues and when the PC restarted I was back to normal but the slow internet was still there and RFI seemed to be dropping the connection still. I just happened to go back to Windows 10 internet connections box (for the 100th time) but this time I noticed for some reason I was back on WIFI. I manually changed it back to LAN and the connection issue was gone and the surfing speed was back.

I decided to restart the PC and have a look at the Windows 10 internet connections box again. After the restart, I was back on WIFI again and it would seem for some reason each time the PC was restarted it would default back to WIFI. The very slow connection was due to the fact the antennas were removed and RFI was affecting the WIFI board via the female antenna connectors.

I then just right-clicked on the WIFI connection icon and clicked disable!! You know what folks that did the trick. Only if 2 hours earlier I had done just that I would not have messed with the BIOS, lost my N1MM+ contest settings, squeezed behind my desk to the rear of the PC and wasted 2 hours. Sometimes the solution is just a click away!!

~ Mike VE9KK

[ve9kk.blogspot.com](http://ve9kk.blogspot.com)

*I was first licensed in 1989 and upgraded to advanced in 2000. I primarily operate contests both CW and RTTY. I have been operating RTTY contests since 2005 and started CW contesting late 2006. I became more interested in CW and CW contesting but I had to get my code up to contest speed. I was able to get from 10 wpm to 34 in about a year with LOTS of practice. During 2007 I was also bitten with the QRP bug and operated my Elecraft KX1. (The KX1 also has been sold) Another part of the hobby I enjoy is kit building; it helps with the long winter nights.*

*My home station consisted of an Elecraft K2 (K2 was sold for funds for a new KX3) and K3 with a Begali contour paddle. My antenna was the MFJ 1788 loop antenna, which was on the balcony here in my condo. Not a mega contesting antenna by any stretch of the imagination. But I do live in an antenna restrictive area and that is the best I can do. It's not all about winning but enjoying the game... Well, it would be cool to be a big gun one day... I did have the Elecraft KX3 and took it with me when I ventured outdoors for some "free-range" operating.*

*So fast forward to where I am in life's travels now... I have retired (2019) and we picked up and moved to New Brunswick in the Canadian Maritimes. I am able to have an outdoor antenna, which is an End-fed multiband antenna. I am now the proud owner of an Icom 7610 radio and it's fantastic, and I am now officially away from Elecraft. Nothing at all wrong with the Elecraft product, but I felt it was time for a change. To fund the change I had to sell the K3 and my 1788 mag loop, which I really had no use for now. I also sold the Begali key as for some reason I just could not get used to it. I purchased the 9A5A solid-state CW paddle and it has been working great. My PC was starting to show it's age and it was with regret that I sold my Elecraft KX3 to fund the new PC upgrade. ~*



Thomas Witherspoon K4SWI / VY2SW

# QRPer.com

QRPer.com

*In this issue of 'The Communicator' we welcome a new contributor. Thomas Witherspoon K4SWI/VY2SW is an avid QRP'er and he maintains a blog at <https://qrper.com/>.*

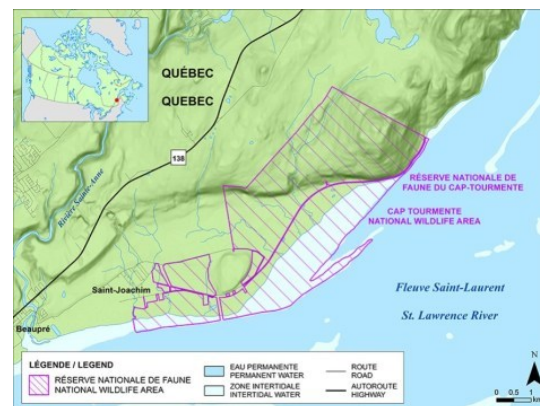
One of our favorite national parks in the Côte-de-Beaupré region of Québec, Canada is Cap Tourenemente National Wildlife Area.

When my family spends the summer in Québec we typically visit it several times, especially since it's never far from where we stay.

Thing is, each entry into Cap Tourenemente costs about \$20 or so (unless we purchase an annual pass), but it's worth it for the hikes, and the scenery. We also like supporting parks with our entry fee.

For a POTA activation? I don't need access to the main park, especially if the family isn't with me. I did a little research and found a spot within the NWA on the "free" side of the park gates.

The spot is a basically a wildlife viewing area with a small grass road that is flanked by marsh land near the town of Saint-Joachim.





Of course...

### **Marsh Land = Mozzies**

Before heading to Cap Touremonte on Monday, June 27, 2022, I sprayed a “healthy” dose of insect repellent on my clothing. Having been to this spot several times in the past, I knew what awaited me: mosquitos. Lots of them.

We have mosquitos back home in the mountains of North Carolina, of course, but not in the quantities you find in marshy areas along the north shore of the St-Lawrence.

That Monday, though, it was very gusty. In the morning we had heavy rains, then a front pushed that through in the early afternoon opening up clear skies and very gusty winds. Mosquitos don’t do well in the wind, so my hope was the wind would offer an extra layer of protection.

Spoiler alert: The winds did help to some degree, but Canadian mosquitoes are heartier than our Carolina varieties.

### **Cap Tourmente National Wildlife Area (VE-0012)**

I had been on the air earlier in the day and conditions were truly in the dumps -at least, at my latitude. I knew it wouldn’t be a quick activation, so I allowed myself extra time to complete the activation.

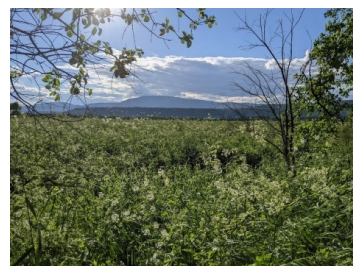
On the 10 minute drive to the site, I decided to pair the Elecraft KX2 with the TufetIn 9:1 random wire antenna that I configured with a 31’ radiator and a 17’ counterpoise. I found this combo very effective in the past and I love the frequency agility of random wire antennas especially when the bands are rough and it becomes a game of band hopping to see what portions might be open.

### **Gear:**

- [Elecraft KX2](#) and [KXPD2 Paddles](#)
- [tufetIn EFRW QRP Antenna Long Wire](#)
- [Moleskine Cahier Journal](#) (affiliate link)
- [Tom Bihn Synapse 25](#) backpack
- Mini Arborist throw line kit: [Tom Bihn Small Travel Tray](#), [Marlow KF1050 Excel 2mm Throwline](#), and [Weaver 8 or 10oz weight](#)
- [Rite In The Rain Weatherproof Cover/Pouch](#) (affiliate link)
- [GraphGear 0.9mm 1000 Automatic Drafting Pencil](#) (affiliate link)
- NORNM homemade 3D-printed knee board
- Camera: [OSMO Action Camera](#) (affiliate link)
- Folding camp chair from ALDI Set up was super quick. I launched a line into a tree branch overhanging the grass path/road and hoisted the radiator into a vertical orientation.

Note that in my real-time, real-life activation video below, I spend a bit of time showing how I configured the TufetIn random wire antenna.

I unfolded my camping chair and placed it on the ground. I sat in the chair to prepare my logs and quickly discovered that the ground was super soft after all of the rain. One of the back legs buried itself under my weight. When I pulled the chair out of the soft ground, one of the rubber feet popped off. I had to sort of hand dig it out of the ground. If you watch my video, you’ll probably notice that my hands aren’t exactly clean! Now you know why.



### On the air

I started calling CQ POTA in CW on 20 meters and worked K0AWG, EA7JXZ, K3MRK, AE2TT, and EA1AF all within about seven minutes. An excellent and promising start!



I then moved up to 30 meters and worked VE3LDT, WB8JAY, and NT2A within about five minutes.

Then a dry spell. After about 15 minutes of no calls at all, I finally logged three more stations on 17 meters: AA0Z, DM3KP, and EC1R. I was very pleased to work both Germany and Spain with 5 watts!

With 11 logged (and 10 required), I had validated the activation at this point.

Next, I did a wee bit of hunting and logged K4NYM on 20 meters and K8UT on 40 meters. What fun!

I had enough flexibility in my schedule that I was able to fit in a bit more time, so I decided to see what activity I might find on the SSB portion of the 20 meter band.

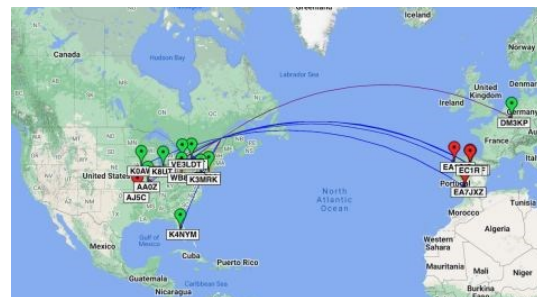
I did not bring my KX2 hand mic on this trip, so I had to make do with the internal mic which worked a charm. I had enough juice left in the KX2 internal battery to run a full 10 watts, so I pumped up the power and started calling CQ POTA. I was very pleased to log EC1R, AJ5C, EA1FIC, EA7JXZ, and EA1GIB.

Obviously, there was a path open to Europe and I was very pleased to work so many stations in Spain.

What fun!

### QSO Map

Here's how well the KX2 and TufetIn random wire pair performed that fine afternoon at Cap Tourentment:



### Activation video

Here's my real-time, real-life video of the entire activation. As with all of my videos, there are no ads and I don't edit out any parts of the on-air activation time. Funny because I thought I'd be filming a very short activation, but it turned out to be a rather lengthy one!







VE7SL's

## Radio Notebook

### **A Long Listen On 1240 kHz**

Steve McDonald VE7SL



Reproduced with the author's permission, Visit The VE7SL Radio Notebook at: [The VE7SL Radio Notebook](#) and Steve's blog at [VE7SL - Steve - Amateur Radio Blog](#)



One of the Broadcast Band's (BCB) six '[graveyard](#)' frequencies is 1240 kHz.

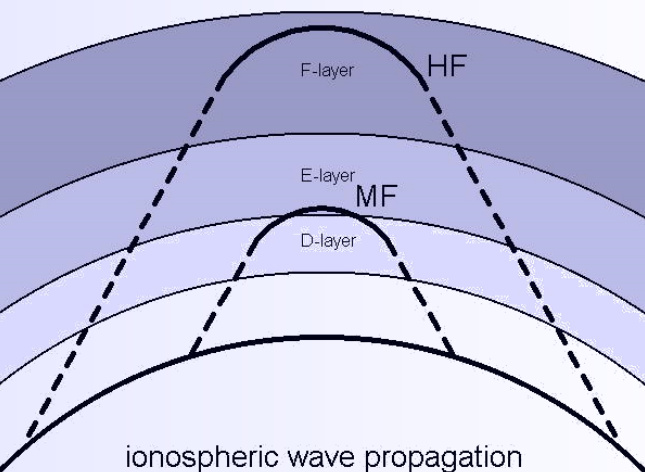
These frequencies (1230, 1240, 1340, 1400, 1450 and 1490 kHz) are assigned to smaller stations running non-directional antennas and up to 1000 watts of power. In North America, there are typically about 150 stations assigned to each frequency.

The origin of this spooky name is often a source of debate. Some suggest that it comes from the cacophony of strange howls and sounds that can be heard on these frequencies at night, as multiple fading signals fight it out to be heard, while others relate it to the similarity of the jam-packed headstones in a typical graveyard. Whatever the true reason, it's a fascinating part of the BCB to explore.

Most BCB DXers enjoy the challenge of tackling the graveyard frequencies as they're often so busy. New

stations will fade in for a brief period only to be replaced by a totally different one a few moments later ... and then a different one soon after. It gets even better if the fade-ups coincide with a local ad or a 'top-of-hour' ID, putting a new catch in the log!

Several days ago I reactivated my [10' x 20'](#) loop and [Wellbrook ALA100N](#) preamp, that I use for NDB and BCB DXing, by adding a new buried coax line from the shack.



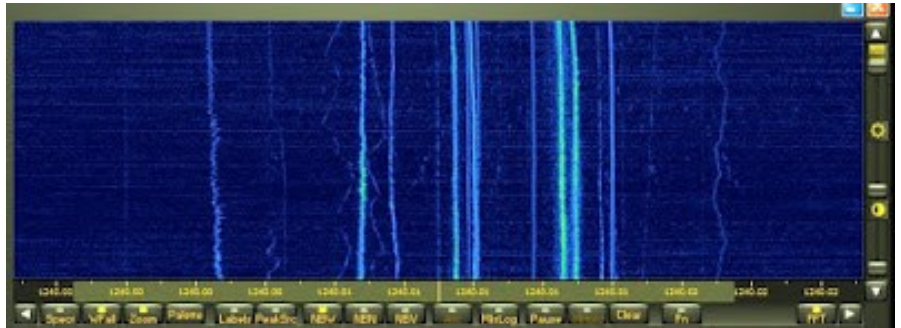
I had previously re-appropriated the loop's coax for a nearby HF wire antenna and had been without the loop all winter.

After BCB DXer Mike Cherry (VE7SKA) on Salt Spring Island, the next island to the west of me, described some of the European action that he had experienced last winter, I am determined to not miss out during the next winter's BCB DX season!

Once getting the loop powered-up in mid-afternoon, I decided to give it a test by making a 'deep-search' on 1240 kHz.

At 1500 hours local time, I wasn't hearing any audio on 1240 but a weak carrier could be detected audibly. Using my Perseus SDR's waterfall in its narrowest possible window, produces an extremely narrow passband, effectively increasing the sensitivity by a huge factor. This allows the waterfall to display weak signals that are presently being propagated to my location but far too weak to be heard by ear. I'm estimating that in this narrow bandwidth, it can dig about 30 dB or more into the noise, but there is a price to be paid for this extra gain... time!

If you're used to watching your receiver's waterfall scroll along quickly, this mode is just the opposite. It moves in very slow increments, allowing the weaker signals to build up enough to be visible before taking the next deep look. The screen capture shown below is a result of a **three-hour listening period**, from 1500-1800 hours local time. The entire waterfall is 25 Hz wide, with each tick representing 1Hz.



3-Hour Daylight  
deep Search

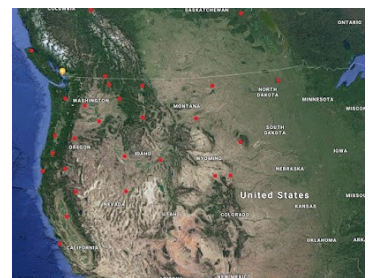
Although no signals were clearly audible during this period, my deep-search revealed the carriers of **~28 different stations** being received here in south-west British Columbia... in the middle of a summer afternoon! It's interesting to note that few of these signals are 100% stable and several can be seen really struggling to maintain their exact assigned frequency. In this highly narrow bandwidth view, even the worst drift amounts to no more than a Hertz, well within the required tolerance of  $\pm 20\text{Hz}$ .

Using the always-reliable [MWLIST](#), the locations of the most likely candidates for these 28 signals are plotted [below right]. These are the 28 nearest stations and with my loop pointing east, a definite east / south-east flavour is evident.



10' x 20' Loop & Wellbrook  
ALA100N Preamp

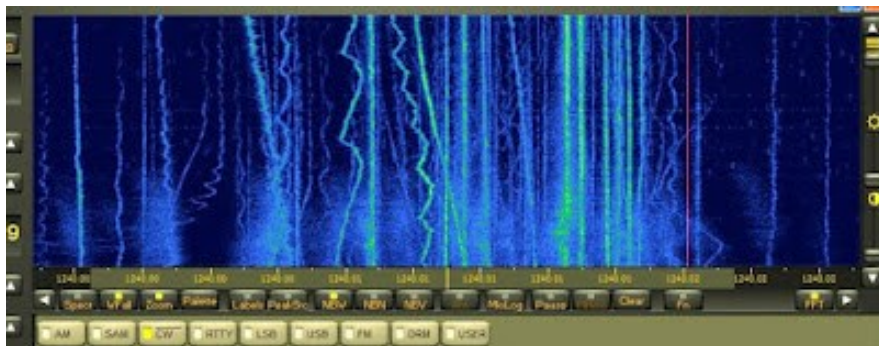
At mid afternoon, one might expect to see only groundwave-propagated signals on the broadcast band. Midday groundwave on the broadcast band can easily travel a few hundred kilometers, gradually growing weaker over the longer paths. Perhaps all of these signals are arriving via this mode as they are at least 20-30dB into the noise. I initially thought that some of the further-out signals were being reflected from a strong daytime D-layer, although most of the energy would be absorbed. Further reading shows detectable groundwave up to



28 plotted signals

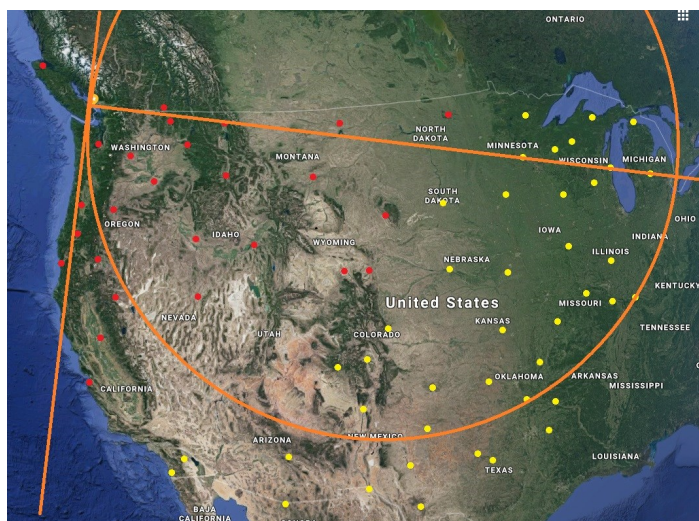
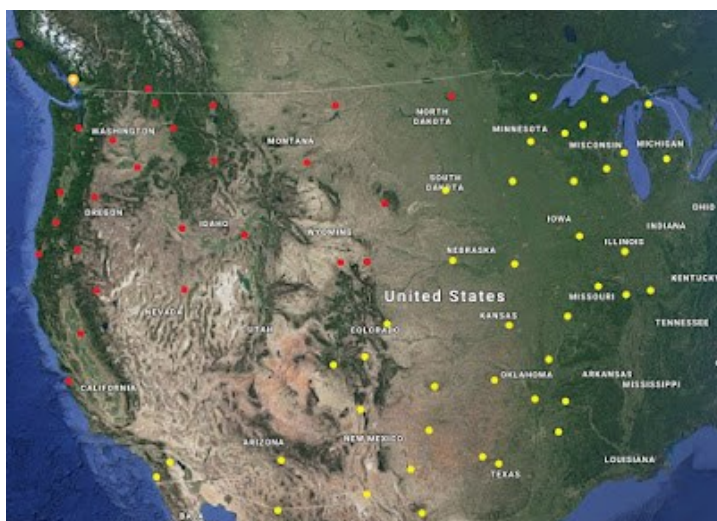


1200km is possible which coincides nicely with the distances observed. Most likely what I'm seeing is a combination of extended groundwave and D-layer refraction on the furthest signals.



3-Hour Daylight  
deep Search

The second screen capture shows the same frequency for another three hours, starting about an hour before local sunset. Some of the weaker signals seen earlier now begin to grow in strength as the D-layer absorption starts to decay and reveal the higher E-layer. By the end of the third hour, an **additional 41 stations** have appeared for a **total of 69 carriers** centered on 1240 KHz. (note that my Perseus calibration is off by a few Hz).



The next 41 closest stations are now plotted below in yellow, showing the most likely source of these signals. The distances illustrated are in-line with single and double-hop E-layer or possibly lower F-layer refraction.

This view shows the directional pattern of the front of the loop while pointing east, with its very broad circular lobe. In this direction, the narrow null is only seen along the coast.

It will be interesting to do a mid-winter follow-up on 1240 and compare the present summer propagation to the much better winter conditions. I expect that at some point, propagation via the higher F-layer will be present and extend skip distances out to the east coast or to South America.

In the meantime, things are almost ready for some pre-sunrise looks to the west and some overnight top-of-hour recordings... as soon as I re-calibrate Perseus!

~ Steve VE7SL





## No-Ham Recipes

Nilay TA3YJ

### Apple roll

Make this roll with tart apples such as Winesap and sweet apples like Fuji, Jonagold, Idared, or Mutsu.

1 cup (250 ml) self-raising flour

1 tablespoon (15 ml) granulated sugar

1½ tablespoons (22.5 ml) butter

Milk or water to mix into dough

3 fully ripe baking apples, peeled and cored

¾ cup (200 ml) granulated sugar

1 tablespoon (15 ml) golden syrup (optional)

1 cup (250 ml) hot water

Preheat oven to 375F (190C or a moderate oven)

Blend together flour, butter and sugar in a bowl with your fingers or a pastry blender until most of the mixture resembles coarse meal. Drizzle evenly with 1 tablespoon cold water or milk and gently stir with a fork until incorporated. Squeeze a small handful: if it doesn't hold together, add more cold water or milk, 1 teaspoon at a time, stirring until the liquid is incorporated, then test again. Do not overwork mixture, or the dough will be tough. When the dough is ready, place it on a lightly floured surface and roll out until ¼ to ½ inch thick.

Grate or very thinly slice the apples and spread them over half the dough.

Fold the other half of the dough over the apple, lightly pinching the edges to seal. Cut the dough into long slices in the direction you folded it. Make 1" wide slices, and then lay them in a lightly buttered pie dish.

Mix ¾ cup sugar and 1 cup hot water, plus an optional 1 tablespoon of golden syrup (for extra flavour). Pour this uncooked syrup over dough slices, and then bake them in moderate oven for 45 minutes.

~ Nilay TA3YJ



# Foundations Of Amateur Radio

Onno Benschop  
VK6FLAB

## *The microphone gain game*



*To listen to the podcast,  
visit the website:*

<http://podcasts.vk6flab.com/>

*. You can also use your  
podcast tool of choice  
and search for my  
callsign, VK6FLAB.*

*Full instructions on how  
to listen are here:*

<https://podcasts.vk6flab.com/about/help>

One of the most misunderstood settings on your radio is the microphone gain. You'll often hear people talking about adjusting it up or down depending on what they hear and the results are often displeasing to the ear.

The very first thing to know is that the microphone gain is likely the single most audible setting on your radio, right after the tuning frequency. It's pretty much the first variable between your voice and your transmitter. Set it too low and you'll hear nothing, set it too high and you'll hear gibberish.

I said it's pretty much the first thing, but it's not the very first. That's your voice, unique in all its glory, loud, soft, happy, sad, funny or not, it's the thing that your microphone captures to transmit. Closely coupled to your voice is the distance between your mouth and your mike. The closer you are, the louder, the further, the softer and the more background noise creeps in.

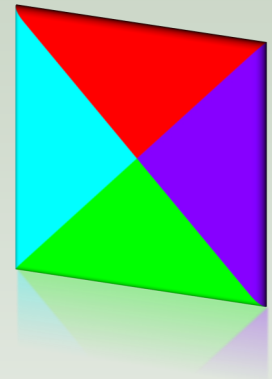
As an aside, speaking of noise, there's background noise at play, but there's also the noise that comes

from the audio circuitry itself, which can for example change depending on the temperature of your radio. I'm going to refer to both as noise here, even though they're slightly different.

So, starting with the ideal model where you always speak in the same way, at the same volume, at the same distance from the microphone, with a constant temperature in your radio, at all times, the next thing is the microphone gain, or gain.

Gain is an imperfect attempt at corralling your utterings into electrical signals without causing the audio circuit to distort or drown in noise. Distortion comes as a result of overloading of the audio circuit when the gain is too high, causing clipping, which essentially changes the audio waveform into something that no longer resembles your voice. At the low end of the gain range there is no difference between audio and noise which results in your voice being buried inside a hissing noise.

You might wonder why we don't just build transmitters that cannot clip and increase your volume. Well, we





do. We use things like AGC, or Automatic Gain Control to attempt to prevent such things from happening, but this isn't perfect.

All this results in the microphone gain being a setting that you need to tune to your voice and adjust as things change. Overall, the best outcome is when you set the gain so the AGC just engages when you talk normally.

This gain setting also applies to computer generated signals, often fed into your radio via an audio or microphone input. If you set the gain too low, noise is the problem, set it too high and the Automatic Gain Control will distort the signal to the point where it no longer works and causes interference for everyone else including the station that you're trying to contact.

On older radios the output power was fixed. This is also true for Software Defined Radios. To reduce output power, you can change the microphone gain down and reduce the power. Change it to halfway and your output power is essentially reduced to half power. This works for a range of settings, but get too low and we're back to noise and audio fighting each other.

The opposite isn't true.

You cannot increase the microphone gain to increase power. The moment you exceed the audio circuit range your signal is distorted. On an SDR this means that you're exceeding the ability of the Analogue to Digital converter to represent your audio. In digital terms, zero means no sound and all on means 100%. If your audio is so loud as to only be 100% on, that's like sending a tone out the transmitter, resembling anything but your voice.

All of what I've talked about is related to SSB signals and to some extent AM. FM is a different animal entirely. For starters, output power on FM is fixed. The next difference is the signal or channel width. Without going into full detail, FM comes in different widths, WFM or Wideband FM, NFM, or Narrowband FM, and between the two, "normal" FM. To make things more fun, not everyone agrees on what each one means at any

given time. Also, channel width and channel spacing are not the same thing, but that's for another day.

Gain aside for a moment, consider two matched FM radios using the same channel width. Your voice volume is determined by how much of the channel you use. Louder means wider, softer means narrower. Adjust the gain up, the signal gets wider, but the limit of the channel width remains, get too high and it clips at the channel width and distorts. At the other end, changing the gain down, you'll use less of the channel width and eventually the noise and your voice will be at the same level and you won't be heard.

Let's look at what happens when you use a normal FM signal to transmit to a narrowband FM receiver. Essentially your signal is too wide and the result is that your voice will be clipped unless you speak really softly or if you've set the gain really low, either way comes with more noise.

Similarly, if you transmit a narrowband FM signal to a normal FM receiver, then your voice will be very low, regardless of the microphone gain setting and turning it up will only distort it due to clipping inside your transmitter.

So, for FM, before fiddling with the gain, make sure that you're using the same FM mode as the other station. One thing to remember is when you use a repeater, if the audio is always too loud for everyone, your mode is probably too narrow. Similarly, if the audio is always too soft and you always need to turn up the volume on your radio, your mode is likely too wide. Check your radio specifications to determine what each mode means.

In broadcast audio this whole thing is managed by calibration using standard tones, but as amateurs we tend to rely on other people reporting their feelings on the quality of your voice with the often heard admonishment to adjust the microphone gain.

~ I'm Onno VK6FLAB

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: <http://amazon.com/author/owh>. Volume 7 is out now.

Feel free to get in touch directly via email: [cq@vk6flab.com](mailto:cq@vk6flab.com), follow on twitter: [@vk6flab](https://twitter.com/vk6flab) or check the website for more: <http://vk6flab.com/>

If you'd like to join a weekly net for new and returning amateurs, check out the details at <http://ftroop.vk6flab.com/>, the net runs every week on Saturday, from 00:00 to 01:00 UTC on EchoLink, IRLP, ALLStar Link, IRN and 2m/70cm FM via various repeaters.

If you'd like to participate in discussion about the podcast or about amateur radio, you can visit the Facebook group: <https://www.facebook.com/groups/foundations.itmaze>

This podcast episode was produced by Onno (VK6FLAB). You can find more at <http://vk6flab.com/>

## The power supply connector dance contest...

In over a decade of writing a weekly article about all manner of different aspects of our hobby and community, I've never once talked about power connectors for your radio. It's so universal as to be invisible and rarely discussed. So much so, that something you do out of habit, makes another stop dead in their tracks and ask themselves why they never thought of it.

Despite how you might feel at the time, there's no such thing as a stupid question. The other day a fellow amateur Dave VK6KV asked about a power connector he'd seen at the local electronics store. That question started a group discussion about powering radios and how best to achieve that.

The very first thing to discuss is that the vast majority of amateur radio transceivers expect a nominal voltage of 13.8 Volt DC. That might sound like a strange requirement, but it's the voltage that comes from a fully charged 12 Volt lead acid battery, which is what many radios use as a power reference.

The next thing to consider is that a transceiver can draw quite a bit of power when it's transmitting. My Yaesu FT-857D user manual suggests 22 Ampere, but I've never seen that in the decade it's been in my possession.

When you purchase a radio, you'll likely discover that it either comes with bare wires, or some random connector that doesn't fit anything else. In many cases I've discovered that people cut off that connector and replace it with whatever standard they've come up with in their shack, but when they take their kit out on a field day, or acquire a new radio, the problem starts all over again.

Let me suggest a different approach.

The Anderson Power company, founded in 1877 by brothers Albert and Johan Anderson in Boston Massachusetts, make a range of connectors called the Anderson Powerpole and they come in a variety of ratings, sizes, shapes and colours.

First introduced as a standard by the ARRL Emergency Communications Course in December of 2000, after previously being adopted by amateur operators in California, the Anderson Powerpole PP15/45 series was selected. The Coordinator for Hawaii State Civil Defense RACES, or Radio Amateur Civil Emergency Service, Ron, then AH6RH, now KH6D has a detailed description on his QSL page on how this came about.

As a result, the stackable, asymmetric, genderless plugs are in wide use within the amateur community. The plugs are



designed to be joined together using various orientations, creating a unique connector to suit your purpose. The Amateur Radio Emergency Service or ARES standard is one such orientation and before you adopt the Anderson Powerpole in your shack, make sure you use their orientation to avoid magic smoke from escaping your equipment.

Picking a connector is just step one.

When you acquire a new piece of 12 Volt equipment, you can cut off the connector and replace it with the ARES Anderson Powerpole connector orientation. Many amateurs I know then throw away the unusable connector, or shove it into a box for later.



Instead, what I do is, terminate the plug that you just cut off in exactly the same way. Essentially, from a visual perspective, you've kept the power cable

intact, but inserted a Powerpole join into the lead. As a result you now have a standard Powerpole power lead and you have a new Powerpole adaptor to suit the new connector.

For that reason alone, I tend to bring a box of spare Red and Black Powerpole connectors to any field day and use the opportunity to spread the love around.

As I said, the individual plugs come in a variety of colours, I have a selection of eleven in my shack, where for me a different colour means a different voltage or purpose. For example, I've adopted green as the colour for antenna radials.

One challenge I'd not been able to resolve, until suggested by Ben VK6NCB, was how to avoid plugging a 12 Volt power supply into something that expects say 7.5 Volts. Colour alone isn't sufficiently idiot proof, especially in the dark. Ben suggested that I adjust the orientation of the plugs, preventing connectors of different colours to mate. Looking back, I can't understand why I didn't think of that in the decade I've been using them.

I will note that there are other Anderson connectors in use. A popular one is the grey double connector, used in portable solar installations and caravans. I'd recommend that you consider if you really want to plug your radio directly into a solar panel or not and choose your connectors accordingly.

Before you ask, to my knowledge the Anderson Power Company doesn't know I exist, nor did I get compensated in any way to say Anderson Powerpole. It's the ARRL Emergency Services standard and I'm happy to advocate for its use everywhere I go.

So, whether you're using bare wires, banana plugs, Molex connectors or some other random barrel connectors, consider cutting the lead and inserting Anderson Powerpole connectors.

When was the last time that you had to do the 12 Volt connector dance?

~ I'm Onno VK6FLAB



As a counterpoint, some disagree with using Powerpoles. Stan VA7NF believes that the rather small contact area can develop resistance at high current, and had this happen when passing about 40A through this set rated for 45A. The lower wire is 10 gauge.

## KB6NU's Column

Dan Romanchik, KB6NU

### Where are all the amateur radio Tik-Toks?



My boss at [ARDC](#) has asked me to take a look at [TikTok](#) and come up with some ideas as to whether it's worth it for us to spend time on creating our own videos. So, today, I created a TikTok account and browsed around for a while, searching for amateur radio content. Honestly, I was a bit disappointed.

Whereas on YouTube there's just tons of amateur radio content, I only found a few TikTokers producing much amateur radio content. These include:

[@glamhamradio](#). Natalie, NW6S, is the TikToker behind this channel(?). She seems to have a good grasp of how to create short, instructional videos.

*When he's not trying to figure out which way current flows, Dan blogs about amateur radio at [KB6NU.com](#), teaches ham radio classes, and operates CW on the HF bands. Look for him on 30m, 40m, and 80m. You can email him at [cwgeek@kb6nu.com](mailto:cwgeek@kb6nu.com).*

[@radioprep](#). David, W5CWT, has only eight videos in his channel, but all of them show how he used regular "stuff" in ham radio.

[@k5ata\\_goodgamehamradio](#). This is the channel of Steve, K5ATA, the ARRL's Education and Learning Manager.

There are 17 TikToks in this channel, but not all of them are related to ham radio.

Am I missing something here? Are there other TikTokers with more and interesting amateur radio content? If so, I'd really like to know about it.

Also, I'm trying to think how we might use TikTok to promote ARDC. I suppose that we could get some grantees to send in videos, then extract clips to post as TikToks. Do you think that would be of any interest to people? I'm kind of thinking that it wouldn't be worth the time and energy.

From my own point of view, I might try to make a few TikToks to illustrate points in my [No Nonsense study guides](#). It should be simple enough to do a few of them and see if they get any traction. What do you think?

~ Dan KB6NU



# HAM LEFTOVERS...

## Simple RG213 Mag Loop (30m-15m)

It's amazing what you can do with a bit of spare coax and an old vintage brass 130PF capacitor with 1mm spacing. During the Lighthouse weekend, when the local QRN was really bad, this simple loop was constructed and performed remarkably well. For safety the capacitor is housed in a recycled plastic wristwatch presentation case. See it at: <https://rsars.files.wordpress.com/2013/01/simple-rg213-hf-loop-30m-15m-g8ode-iss-1-31.pdf>

## Radio amateurs in court

Lewis M3HHY has released a video that takes a look back at the UK radio amateurs who were prosecuted during World War 1. Among them is Archibald George Cocks who, in December 1914, was given a sentence of six month imprisonment for possessing a largely dismantled radio which didn't even have any antenna. Also mentioned in the case was his possession of a Morse buzzer which he and his wife had been using to keep up their Morse practice. [Watch Radio Amateurs In Court!](#)

Read the letter concerning the plight of Archibald George Cocks sent by the Birmingham Wireless Association on PDF page 47 (WW p653) in January 1915 Wireless World at <https://worldradiohistory.com/UK/Wireless-World/10s/Wireless-World-1915-01-S-OCR.pdf>. Following his sentence Archibald wrote to Wireless World, see PDF page 50 (WW p722) of February 1915 issue at <https://worldradiohistory.com/UK/Wireless-World/10s/Wireless-World-1915-02-S-OCR.pdf>.

## Dundalk Amateur Radio Society EI7DAR—Our sister club in Ireland

Some of you may not be aware that we have a sister club [EI7DAR](#) in Ireland. Here is the newsletter of their and other clubs in the area. There are some interesting articles although many are European based.

<https://www.docdroid.net/9HeUihX/crnews0722-pdf>

## Can you make a CW contact on a voice-only satellite?

Yes, apparently you can... Here's an entertaining video of a CW contact on a non-CW satellite:

<https://youtu.be/RclvuJJDqWQ>

## Turning a cheap engraver into a PCB mill

We know, we know. Getting PCBs professionally fabricated anymore is so cheap and easy that making them in-house is increasingly becoming something of a lost art. When you're in Brazil and it takes months for shipments to arrive, sometimes you're better off sticking with the old ways.

Tom Nardi tells us how a reader decided to buy a ~\$150 CNC "engraver" kit from an import site, in hopes that it would allow him to prototype his designs without having to use breadboards all the time. The kit turned out to be decent. See it at: <https://hackaday.com/2018/09/12/turning-a-cheap-engraver-into-a-decent-pcb-mill/>





# Radio Amateurs of Canada

## Canadian Amateurs Call Sign Policy Survey

Radio Amateurs of Canada (RAC), the national association for Amateur Radio in Canada, is once again conducting an online survey to enable us to better serve Canadian Amateurs.

RAC is a volunteer-based organization and we rely on the feedback from members and non-members to help us stay informed and up to date on Amateur Radio matters of interest to them.

From time to time, we will be conducting various surveys to help us to achieve these objectives. The current survey was prepared by our Regulatory Affairs Officer Dave Goodwin, VE3KG, to solicit the opinions of Canadian Radio Amateurs on the policy concerning Amateur Radio call signs in Canada:

RIC-9 -- Call Sign Policy and Special Event Prefixes

The current policy has been in place for almost 20 years and we would like your input to develop proposals for change to present to our regulator - Innovation Science and Economic Development Canada - for their consideration.

Eligibility: The survey is anonymous and is open to anyone holding a Canadian Certificate and call sign.

The survey is comprehensive and it covers such questions as:

- should Canadian Amateurs be required to change their call signs when they move to another region of Canada?
- should Canadian Amateurs be required to reconfirm their call signs every few years?
- should call signs with one suffix letter be issued as permanent personal call signs?
- should call signs with prefixes other than the traditional VA, VE, VO and VY prefixes be issued as permanent personal call signs?

Other topics include:

- rules on two-letter suffixed call signs
- rules on the handling of the call signs of deceased Amateurs
- special prefix authorizations
- special event call sign authorizations

The survey will run from August 5 to September 30. It will take approximately 10 to 15 minutes to complete and is available at the following link. Thank you for participating!

Survey : <https://forms.office.com/r/rk2wYGm6jf>



the [September-October](#) issue of *The Canadian Amateur*, the electronic TCA (eTCA) is now available for viewing or download for RAC members.



## *New bands available in Canada*

On July 28, 2022, Innovation Science and Economic Development Canada (ISED) released an update to a very important document for Canadian Radio Amateurs: “RBR-4 - Standards for the Operation of Radio Stations in the Amateur Radio Service”.

The document specifies what frequencies we may operate on and with what bandwidths.

There are two major new additions to our spectrum:

- 472 to 479 kHz, also known as 630 metres: on this new band, we are allowed to run a maximum of five watts EIRP, using emissions with a maximum bandwidth of 1 kHz.
- 5351.5 to 5366.5 kHz in the 60 metre band: this is a new worldwide allocation. Canadian Amateurs are allowed to run a maximum of 100 watts ERP, using emissions with a maximum bandwidth of 2.8 kHz.

The new 60 metre band is in addition to our existing fixed-frequency allocations at 5332, 5348, 5373 and 5405 kHz. The new 15 kHz-wide allocation overlaps our existing authority to use 5358.5 kHz. Canadian Amateurs are unique in having authority to use 100 watts ERP on the four spot frequencies and on the new 15 kHz worldwide segment. Amateurs in most countries are limited to 25 watts or less and may operate only in the new 15 kHz-wide segment.

Please note that Amateur Radio is a Secondary radio service on these bands. Amateurs may not cause harmful interference to Primary users and we may not claim protection from interference by Primary users.

There are other small changes in RBR-4 that bring Canadian Amateur Radio regulations in line with changes agreed at several previous World Radio Conferences (WRCs) of the International Telecommunications Union (ITU).

Radio Amateurs of Canada would like to thank former Regulatory Officer Richard Ferch, VE3KI, for his dedicated work over several years to bring these changes forward.

You can find the English version here:

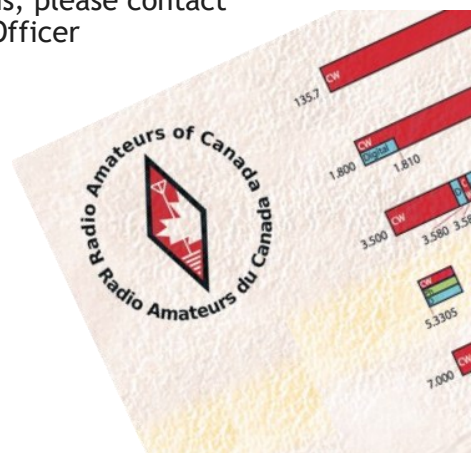
<https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10650.html>

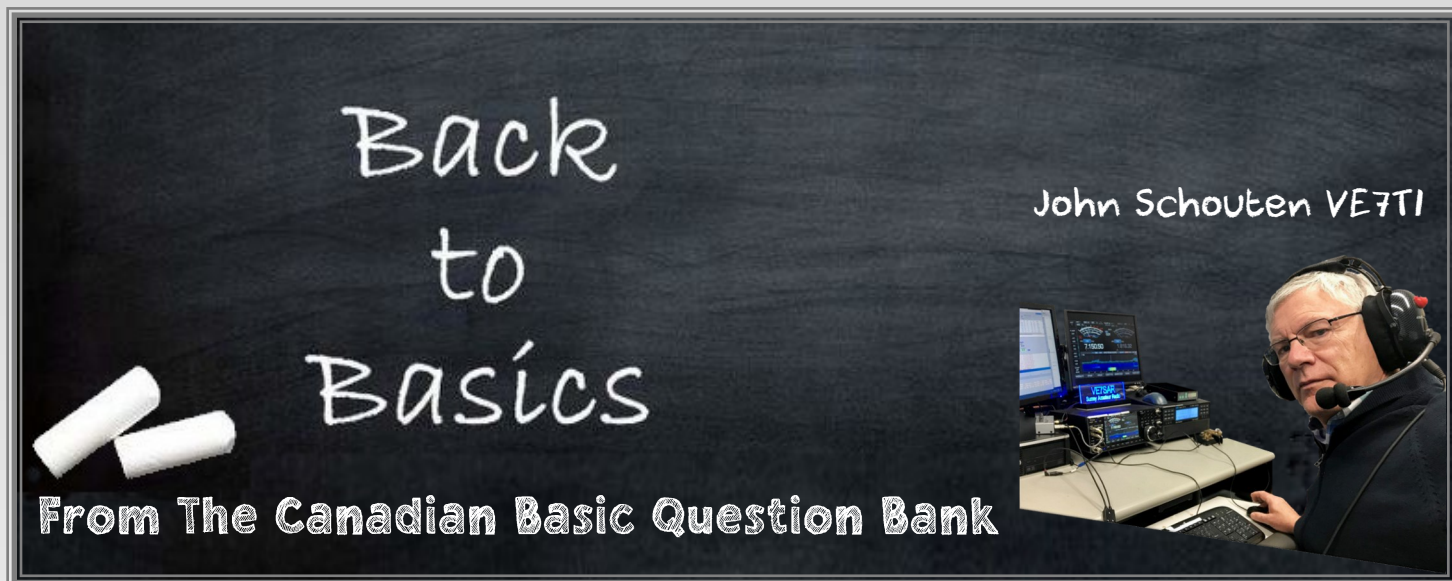
You can find the French version (IPR-4) here:

<https://www.ic.gc.ca/eic/site/smt-gst.nsf/fra/sf10650.html>

If you have any questions, please contact RAC Regulatory Affairs Officer Dave Goodwin, VE3KG, at [regulatory@rac.ca](mailto:regulatory@rac.ca).

~ Dave Goodwin, VE3KG  
Regulatory Affairs  
Officer





## About resonance and those wires in the pavement

*Like many of these articles, the subject of this issue's 'Back to Basics' came up during our recent Basic Amateur Radio Certification Course. In a discussion of the mysterious properties of resonance, a course topic that often produces that 'deer-in-the-headlights' look, several real-life examples were suggested. I suggested one that we as drivers, deal with every day. That is the sensor embedded in roadways controlling traffic signals, based on traffic volume.*

There are about a dozen questions in the Canadian Basic Amateur Radio Question Bank. Here is one that directly relates to the topic in this issue.

**B-005-012-004** A tuned circuit is formed from two basic components. These are:

- A inductors and capacitors
- B resistors and transistors
- C directors and reflectors
- D diodes and transistors

I'm sure that many of you have seen the outlines of these embedded wires in the roadway, but it frustrates me as a driver,

when I see folks stop so far short of the intersection that the sensor just ahead of them does not detect their presence. When that happens others in line must deal with increased waiting time at a red light when otherwise it would turn green, defeating the technology, not having detected a waiting vehicle.

There are all sorts of technologies for detecting cars, everything from lasers to rubber hoses filled with air. Nowadays the most common technique is the inductive loop. An inductive loop is simply a coil of wire embedded in the road's surface. To install the loop, workers lay the asphalt and then come back and cut a groove in the asphalt with a saw. The coil of wire is placed in the groove and sealed with a



*Embedded wires in the pavement form an inductive loop*





rubbery compound. You can often see these big rectangular loops cut in the pavement because the compound is obvious.

This wire routes to the traffic signal computer at the intersection. When a metallic object passes or is stopped over this embedded loop, the resonance of the circuit changes, much like tuning an RF transformer with a ferrite slug. The change in inductance affects circuit resonance in the tuned circuit, and this 'detuning' activates the traffic light sequence change. So inductive loops work by detecting a change of inductance. To better understand the process, let's first look at what inductance is.

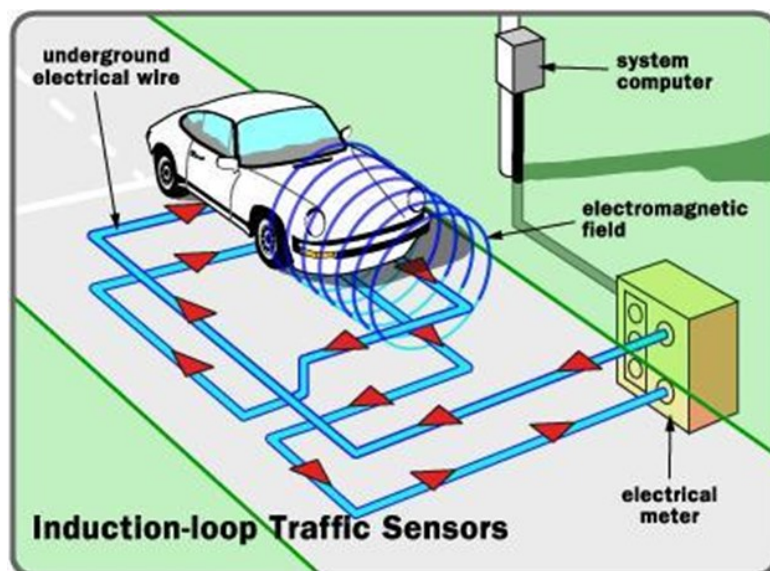
The term inductance was coined by Oliver Heaviside in May 1884, and it is named for Joseph Henry, who discovered inductance independently of Faraday. Inductance is the tendency of an electrical conductor to oppose a change in the electric current flowing through it. The flow of electric current creates a magnetic field around the conductor. The field strength depends on the magnitude of the current and follows any changes in current. From Faraday's law of induction, any change in magnetic field through a circuit induces an electromotive force (EMF) more commonly known as voltage in the conductors, a process known as electromagnetic induction. This induced voltage created by the changing current has the effect of opposing the change in current.

An electronic component designed to add inductance to a circuit is called an inductor. It typically consists of a coil or helix of wire.

The capacity of an inductor is controlled by two factors:

- The number of turns of wire; and
- The material that the coils are wrapped around (the core)

Putting iron in the core of an inductor gives it much more inductance than air or any other non-magnetic core would. There are devices



that can measure the inductance of a coil, and the standard unit of measure is the 'henry'.

So... Let's say you take a coil of wire perhaps 5 feet in diameter, containing five or six loops of wire. You cut some grooves in a road and place the coil in the grooves. You design a tuned circuit that includes the coil and a capacitor. We know that in a tuned circuit there is only one frequency where the circuit resonates. If we change the value of either the coil or the capacitor, we change the resonant frequency and detune the circuit. Placing metal near the coil changes its inductance. If you stop a car over the coil and check the inductance again, the inductance will be much larger because of the large steel object positioned in the loop's magnetic field. The car stopped over the coil is acting like the core of the inductor, and its presence changes the inductance of the coil.

A traffic light sensor uses the loop in that same way. It constantly monitors the resonance of the loop in the road, and when the circuit detunes because inductance rises, it knows there is a car waiting!

So, to get back to our sample question, the correct answer is:

**B-5-12-4** A tuned circuit is formed from two basic components. These are:

A. inductors and capacitors

The technical explanation is that a 'tuned' circuit is a synonym for a 'resonant' circuit. Resonance is the condition where Inductive Reactance ( $X_L$ ) is equal in value to Capacitive Reactance ( $X_C$ ). Inductors and Capacitors alone determine the resonant frequency of a circuit.

In conclusion... if you are the driver stopped in front of me, well short of the red light at the intersection, please move into the loop.

~ John VE7TI



***Do you need more information about our courses?***

### ***Study Links for more information***

Whether you are new to the hobby or brushing up on skills, you should find these study links helpful:

1. RIC-7 is the entire up-to-date Industry Canada (IC) Basic Question Bank.  
<http://tinyurl.com/CanadaBasicQB>
2. Industry Canada (ISED) on-line practice page:  
[https://apc-cap.ic.gc.ca/pls/apc\\_anon/apeg\\_practice.practice\\_form](https://apc-cap.ic.gc.ca/pls/apc_anon/apeg_practice.practice_form)
3. The Amateur Radio Exam Generator is at:  
[https://www.ic.gc.ca/eic/site/025.nsf/eng/h\\_00040.html](https://www.ic.gc.ca/eic/site/025.nsf/eng/h_00040.html)
4. The ExHaminer Study software for Windows is at: <https://wp.rac.ca/examiner-v2-5/>
5. VE3YT has an excellent question-based guide available at [ve3yt.com](http://ve3yt.com)

Contact SARC if you wish to write the Basic or Advanced Exam. If you pass we'll even give you a year free as a SARC prospective member!

**Newly Licensed?** When you receive your paper license in the mail, it will come with a form that can be filled out and mailed to the Radio Amateurs of Canada office, at which point an introductory RAC one-year membership will be set up. Introductory memberships are identical to our existing basic memberships and you will receive The Canadian Amateur magazine for one year.



## HAMpuzzle V1.2

Our new students are often confused by the block diagrams for receivers and transmitters. A freeware program to practice assembling block diagrams for the Canadian Amateur Radio Basic certification exam runs under Microsoft Windows (but also works flawlessly on Ubuntu 10.04 + Wine 1.2.2)

HAMpuzzle V1.2 (2014 04) <https://www.rac.ca/wp-content/uploads/2014/04/HAMpuzzle/HAMpuzzle12.zip>

Be sure to download at least one set of Diagrams from the web page and deposit the bank(s) in the same folder as the program. For Basic:

[https://www.rac.ca/wp-content/uploads/2014/04/HAMpuzzle/HAMpuzzle\\_Diag\\_Basic.zip](https://www.rac.ca/wp-content/uploads/2014/04/HAMpuzzle/HAMpuzzle_Diag_Basic.zip)

Radio Amateurs of Canada is pleased to make the HAMpuzzle© program available and extends sincere thanks and congratulations to François Daigneault, VE2AAY, for writing and providing it as freeware to anyone wishing to download it.

~ RAC

## Course update...



Kevin McQuiggin VE7ZD/KN7Q instructing the SARC CW class in the art of developing a good 'fist'.

It was a busy year for courses. On-line for Basic, and in the classroom for CW. The most recent course to complete was the CW course. Many students passed on their first or second test. Others passed the receive test but needed a bit more time to practice sending.

There will be two follow up sessions in September. One is an oscillator building workshop, the other is a hands-on receive and send session to put their learned skills on the air.

~





1. Did we meet the course objectives? Was there something that you would like to see added or deleted?  
 • Absolutely met objectives.
2. How are the audiovisuals and recordings?  
 (Please comment if you prefer the PowerPoint slides, whiteboard, demonstrations, review videos, or other?)  
 • Recordings were good, although there was one where audio was less than ideal (but still useable).  
 • I preferred PowerPoint slides but appreciated being able to reference the course manual.
3. Any comments on the manual, other course material, emails or CANVAS as a resource?  
 • The entire course is very well organized and exceeded my expectations in every way.  
 • This is the most value per \$ of any course I have taken!



# SURREY AMATEUR RADIO basiccourse

OBTAIN YOUR FEDERAL AMATEUR RADIO CERTIFICATE

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- Ideal for outdoors activities. Long range communications anywhere for free without commercial infrastructure
- Use satellite communication to speak around the world, perhaps even to an astronaut
- Participate in 'Radio Sports' like Contesting and Hidden Transmitter Hunts
- Enhance your personal and your community's preparedness in an emergency
- Use a radio, computer, smartphone or tablet for free worldwide voice and digital communications
- Practice an exciting hobby or start a career opportunity

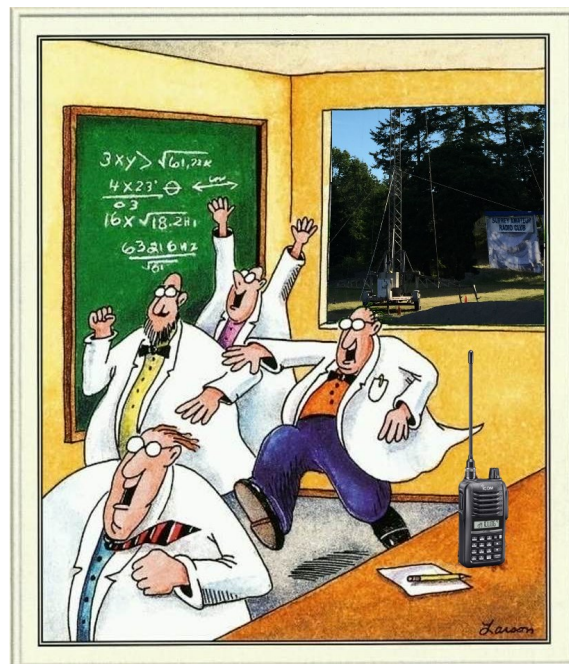
### Calling all New Amateurs: Get your Name in Lights!

Did you get your Amateur Radio certificate within the past year or two and want to introduce yourself through TCA to the Amateur Radio community? If so we would love to hear from you.

Drop a line to [tcamag@yahoo.ca](mailto:tcamag@yahoo.ca) and tell us how you were introduced to the magic of Amateur Radio.

Do you credit any particular Amateur ("Elmer") with getting you started? Which aspect of the hobby do you enjoy so far?

Please be sure to include your name, call sign, date and level of certificate – and don't forget to include a photo or two. We hope to hear from you soon!



At the end of another course the instructors get back to their radios

Show us yours...

### 'Build a Key' contest

After Luc showed us how you can make a key in the March-April 2022 issue of The Communicator, we asked our members to submit their homemade versions of:

#### **The most useful key**

This key must be compact, accurate, comfortable to use and reasonably sturdy.

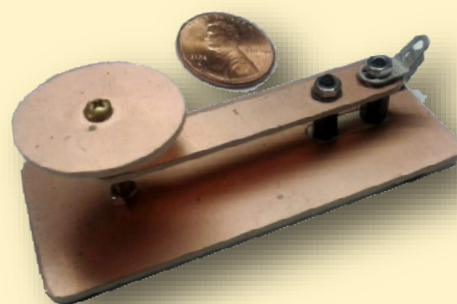
#### **The most beautiful key**

Goes without saying... this one must be a thing of beauty but must also conform to the above criteria of being accurate, comfortable to use and reasonably sturdy.

#### **The most unique key**

Aside from being accurate, comfortable to use and reasonably sturdy, let your imagination run wild.

Well, we had email from elsewhere but no local entries. Disappointing! We will show you some of the photos received in the November-December Communicator issue instead. If you have a self-built key that you are proud of, please send a photo and/or description to [communicator@ve7sar.net](mailto:communicator@ve7sar.net)



# SEPTEMBER 2022

| Sun                                                                                                                              | Mon                                                                                 | Tue                                   | Wed                             | Thu                                 | Fri | Sat                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------|-------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                  | For details on all SARC events,<br>go to <a href="http://ve7sar.net">ve7sar.net</a> |                                       |                                 | 1                                   | 2   | 3<br>Coffee: 0700-0830<br>Denny's 6850 King<br>George Blvd.,<br>Surrey<br>OTC Open—10-<br>Noon<br>Contest: CO, TN<br>QSO party (SSB,<br>CW) |
| 4<br>Contest: CO, TN<br>QSO party (SSB,<br>CW)                                                                                   | 5<br>Labour Day                                                                     | 6<br>1930 SEPAR Net<br>2000 SARC Net  | 7<br>SARC Meeting<br>1900-2100  | 8                                   | 9   | 10<br>Coffee: 0730-0930<br>Denny's<br>OTC Open—10-<br>Noon<br>Contest: WAE DX<br>Contest (SSB), AL<br>QSO party                             |
| 11<br>RunSurreyRun!<br>Contest: WAE DX<br>Contest (SSB), AL<br>QSO party                                                         | 12                                                                                  | 13<br>1930 SEPAR Net<br>2000 SARC Net | 14                              | 15                                  | 16  | 17<br>Coffee: 0730-0930<br>Denny's<br>OTC Open—10-<br>Noon<br>Contest: IA, TX,<br>NJ, NH QSO Party.<br>WA State Salmon<br>Run (SSB, CW)     |
| 18<br>On-line Basic<br>Course Intro<br>19:00 hrs<br>Contest: IA, TX,<br>NJ, NH QSO<br>Party. WA State<br>Salmon Run (SSB,<br>CW) | 19<br>On-line Basic<br>Course<br>19:00 hrs                                          | 20<br>1930 SEPAR Net<br>2000 SARC Net | 21                              | 22<br>SEPAR<br>Meeting<br>1900-2100 | 23  | 24<br>Coffee: 0730-0930<br>Denny's<br>OTC Open—10-<br>Noon<br>Contest: CQ WW<br>DX (RTTY), ME                                               |
| 25<br>WARA Swap Meet<br>Victoria<br>25: Contest: CQ<br>WW DX (RTTY),<br>ME                                                       | 26<br>On-line Basic<br>Course<br>19:00 hrs                                          | 27<br>1930 SEPAR Net<br>2000 SARC Net | 28<br>1900 SARC Exec<br>Meeting | 29                                  | 30  |                                                                                                                                             |

Contest Details: <http://hornucopia.com/contestcal/contestcal.html>



# OCTOBER 2022

| Sun                                                                 | Mon                                                                                                                              | Tue                                                            | Wed                                               | Thu                                                            | Fri       | Sat                                                                                                                                                 |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                     | <div>For details on all SARC events, go to <a href="http://ve7sar.net">ve7sar.net</a></div>                                      |                                                                |                                                   |                                                                |           | <b>Coffee: 0730-0930</b><br>Denny's 6850 King George Blvd., Surrey<br><b>OTC Open: 10-Noon</b><br><b>Contest</b> CA QSO Party (SSB, CW)             |
| <b>2</b><br><br><b>Contest</b> CA QSO Party (SSB, CW)               | <b>3</b><br><br><b>On-line Basic Course</b><br>19:00 hrs                                                                         | <b>4</b><br><br><b>1930 SEPAR Net</b><br><b>2000 SARC Net</b>  | <b>5</b>                                          | <b>6</b>                                                       | <b>7</b>  | <b>8</b><br><br><b>Coffee: 0730-0930</b><br>Denny's<br><b>OTC Open: 10-Noon</b><br><b>Contest:</b> NV, AZ, PA, SD, QSO Party (SSB, CW)              |
| <b>9</b><br><br><b>Contest:</b> NV, AZ, PA, SD, QSO Party (SSB, CW) | <b>10</b><br><b>Thanksgiving (Canada)</b><br> | <b>11</b><br><br><b>1930 SEPAR Net</b><br><b>2000 SARC Net</b> | <b>12</b><br><br><b>SARC Meeting</b><br>1900-2100 | <b>13</b>                                                      | <b>14</b> | <b>15</b><br><br><b>Coffee: 0730-0930</b><br>Denny's<br><b>OTC Open—10-Noon</b><br>(Antenna Workshop)<br><b>Contest:</b> IL, NY QSO Party (SSB, CW) |
| <b>16</b><br><br><b>Contest:</b> IL, NY QSO Party (SSB, CW)         | <b>17</b><br><br><b>On-line Basic Course</b><br>19:00 hrs                                                                        | <b>18</b><br><br><b>1930 SEPAR Net</b><br><b>2000 SARC Net</b> | <b>19</b>                                         | <b>20</b><br><br><b>10:20 AM</b><br><b>The Great Shake-out</b> | <b>21</b> | <b>22</b><br><br><b>Coffee: 0730-0930</b><br>Denny's<br><b>OTC Open—10-Noon</b><br>(Antenna Workshop)<br><b>Contest:</b> CQ WW DX Contest (SSB)     |
| <b>23/30</b><br><br><b>Contest:</b> CQ WW DX Contest (SSB)          | <b>24/31</b><br><b>31: Halloween</b><br>      | <b>25</b><br><br><b>1930 SEPAR Net</b><br><b>2000 SARC Net</b> | <b>26</b><br><br>1900 SARC Exec Meeting           | <b>27</b><br><br><b>SEPAR Meeting</b><br>1900-2100             | <b>28</b> | <b>29</b>                                                                                                                                           |

Contest Details: <http://hornucopia.com/contestcal/contestcal.html>

# Local Ham Gear For Sale

More listings at [hamshack.ca](http://hamshack.ca)



For sale is a **Kenwood matching speaker** (blue-grey), model SP-70. The Kenwood SP-70 is a great addition to your TS-400 or the TS-700A series transceivers. It features a 4.75 inch speaker element and can handle up to 2.5 Watts. This 8 ohm speaker has a frequency response of 300 to 5000 Hz. The rear panel has screw terminals. Measures 6.5 x 4.875 x 7.875 inches 3 lbs Asking \$50



Do you have multiple radios, mics or speakers? Would you like to patch them all to one audio source or output? The [ProCo 148 PatchMaster](#) is a 24-channel A-B audio patch bay.

Connect your various radio outputs and inputs, even your foot pedal and simply jumper them with a 1/4" patch cable to select between each. I used it between 3 transceiver speakers, 2 computers, 3 mics, my foot pedal and selected either my speaker, one of 2 headphones or all three.

Each individual jack in this patch bay can be configured. 24 separate channels (48 configurable ins and outs). Ability to switch between normal, non-normal and half-normal positions on each channel. For a full description of this, see [Patch Bays - A Beginners Guide | Hosa \(hosatech.com\)](#). The unit fits a standard 19-inch rack. User manual included. Asking \$50



Providing up to five Watts of RF power, along with big audio output (700 mW) and unmatched protection against the elements! Protected against water ingress to IPX7 specifications (submersion for up to 30 minutes at a depth of 3 feet), the VX-170 features a long operating time, thanks to the supplied 1400 mAh NiMH Battery Pack which is in good shape. This is one solid little radio and is built like a brick.

Included are the special threaded USB programming cable (CHiRP compatible), BNC to SMA antenna adapter, a second battery back for AA cells and a USB charging cable, together a \$45 value. Asking \$110.

For the above items, contact: John VE7TI [ve7ti@rac.ca](mailto:ve7ti@rac.ca)

1. CTEK Model US3300 battery charger \$50 see the manual at: [manualslib](http://manualslib)
2. Sinclabs SP12 power supply 12v 12Amp \$20



Contact: John VA7XB [va7xb@rac.ca](mailto:va7xb@rac.ca)

If anyone has a mobile radio with a detachable head that has an alphanumeric display that I could either buy or trade for. I have an Icom 2720 in great condition, unfortunately it does not have an alphanumeric display and makes me carry a cheat sheet, I'm not at the point where I can really remember the frequencies.

Ralf Stewart: [VE7IHE@outlook.com](mailto:VE7IHE@outlook.com)

**FOR  
SALE**  
Ham Radio Gear

## SURREY AMATEUR RADIO COMMUNICATIONS

# Radio-Active

## Profiles Of SARC Members

Thomas Willms, one of SARC's newer and most enthusiastic members, comes to SARC from the 2019 ham certification class. He has lived in Surrey all his life. Since graduating from high school in 2019 he has taken a handful of university courses both personal and work-related.

His first job out of high school was at an aircraft component overhaul and repair facility where he was working mainly on DC starter/generators found on light turbine powered aircraft. After working there for about a year he moved on to an aircraft electronics company where they work on everything electrical on both fixed wing aircraft and helicopters, most of which comprises of retrofitting modern avionics into older aircraft. This can be as simple as replacing a VHF radio with a more modern version, or pulling out everything on the instrument panel and replacing the many analog gauges with touchscreen flight displays.

Thomas is in charge of the panel production department. When completing a major upgrade it is often necessary to replace the instrument panel due to the different dimensions and layout of the new electronics. His job is to reverse-engineer the existing

instrument panel, design a layout including the new systems, and the various placards which provide information and warnings to the pilot. After completing the design work in AutoCAD, the panel is cut from aluminum using a CNC router, powder coated, and any text or graphics are engraved using a CO2 laser. Thomas is very happy to have found a job where he can combine his love for aviation and electronics.

Since Thomas was young he has been interested in amateur radio, after discovering it online. At the age of 18 he took the SARC basic course and passed the exam with honours but it wasn't until after the pandemic that he began to get more involved in both amateur radio and SARC.

Thomas is especially interested in the integration of computers and radio. He currently only has VHF/UHF capabilities. His primary radio at



Thomas Willms  
VE7TXL



## SURREY AMATEUR RADIO COMMUNICATIONS



*Thomas has become an avid contester*

home is a Yaesu FT-3000M connected to an old desktop computer through a serial interface and on-board sound card for digital modes. He also has an RTL-SDR receiver, a Yaesu FT-70DR, and the ubiquitous

Baofeng UV-5R. He enjoys experimenting with a variety of simple digital modes on FM VHF including SSTV, APRS, and Winlink.

In the past year Thomas has become very interested in HF contesting thanks to the availability of the station at the OTC.

At the time of writing, Thomas was studying for his morse code endorsement and recently passed the exam. Over the coming months, he will be taking the RAC's advanced course to obtain his advanced certification and plans to begin building an HF station at home in the winter months.

Thomas is very interested in all things aviation. He is nearing the end of his training for his private pilot's license and should have it by the end of this summer. He started off flying Cessna 152s but has recently transitioned to the slightly larger Cessna 172. While many pilots struggle with radio communication in the beginning of their training, he claims it came very naturally to him, and believes that amateur radio played a large part especially when it comes to "mic fright".

Along with most other hams Thomas has a strong interest in and aptitude for computers. For many years he has enjoyed selecting components and building computers from parts. With an interest in open source software which he finds has a very similar "working together" approach found in amateur radio, Linux, and specifically the Debian distribution (or a variant of) are the operating systems used on most computers in his house.

Thomas concludes his biography by stating that ever since he attended the first day of the basic course in 2019, SARC and SEPAR members have been incredibly welcoming and helpful:

"Although I may be one of the younger faces in our club, I have always felt at home. SARC has given me the opportunity to explore many aspects of amateur radio. From fox hunting, to HF contesting and everything in between SARC has been very active. I have enjoyed watching SARC grow so much, even in the few short years I've been involved. I enjoy helping out where I can, even if it's outside of my knowledge or comfort zone, and receiving mentorship from the many Elmers in our club. As our club grows the resource for knowledge and skill exchange becomes greater, which I believe is one of the most important benefits to joining a club such as SARC. There will always be someone who knows how to do anything."

~

No SARC meeting minutes for July and August in this issue, and no guest presenters. As you may be aware, we don't meet formally in July and August. Instead, we have a social get together. Both months were well attended and provided opportunities to just sit, chat and enjoy a refreshment and a sample of many food items brought by those attending (Oh, those samosas!).

Of course, after coffee we head down to the Operations & Training Centre (OTC), usually until at least noon. There members and visitors can participate in ham related activities of all types, whether tuning an antenna, getting on the radio or brushing up on course content.



## SURREY AMATEUR RADIO COMMUNICATIONS



John Brodie VA7XB



### Another Successful Contest Under our Belts

It has been a quiet summer for contesting, with the Worked All Europe (WAE) CW contest the only one challenged by SARC during July and August. In fact the WAE turned out to be a disappointment for us as propagation was very poor from the West Coast to Europe. I was away on vacation for this one, but Dino VE7NX and Jan VA7VJ reported that it was not worth the effort and they abandoned it early.

Too bad because despite several problems which recently arose with the equipment, some considerable effort had been put into getting it operational in time for the WAE.

This is as good a place as any to describe those problems. At the Canada Day contest in early July, we observed that the rotator on our gray tower was erratic and it finally gave out altogether.

The cabling connections and controller had some issues which were fixed, but the main problem was the rotator itself, and this meant that the tower had to come down. Once the Spid rotator was removed and disassembled, it became apparent that water had

gained access to the motor and corrosion caused it to seize up. Thanks to Steve VE7SXM who was able to clean it up, reassemble and get it working again.

In the meantime, the rotator on the tower had been replaced by our backup unit (also a Spid. The repaired unit will be used on bigfoot whenever it is deployed.

We also had an issue with 15m on the TH7 beam which was not tuning as expected. The problem was found to be a discontinuity across a 10m trap on the reflector, which was easily fixed by replacing a sheet metal screw on one end of the trap. Reminder: we need to check the other traps and replace with SS screws if needed.

While bigfoot is used at the OTC only on special occasions (like Field Day), it became noticed that we needed to replace the tires, likely 20+ years old. The unit was towed to Vancouver Axle and Frame where they also serviced the hand brake, repacked the wheel bearings and conducted a safety inspection. All this was done in July.

It was reported in the last Communicator that a failure of the



## SURREY AMATEUR RADIO COMMUNICATIONS

generator used to power the raising apparatus on bigfoot, gave us some angst before Steve and Gord VA7GK figured out that we could bypass it with use of external power. Since then, the generator has been disassembled and the electrical system diagnosed. At the time of writing, the point of failure is believed to be the voltage regulator which will be replaced.

All the foregoing will hopefully put us in readiness for the fall contest season, as described in the calendar. We plan to challenge the CQ WW DX contest for RTTY on Sept. 24-25th. Who is interested?

~ John VA7XB



### Reprint Policies

These are policies for reprints from The Communicator, a bi-monthly journal about amateur radio and other topics published by Surrey Amateur Radio Communications (SARC).

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### We welcome your comments and feedback

Please consider leaving a comment via email to [communicator@ve7sar.net](mailto:communicator@ve7sar.net), or on our blog site <https://ve7sar.blogspot.ca> or, better yet, contact our authors directly, so they know someone out there is reading our publication.



### Club News, Amateur Radio Courses, Nets and Articles...

**Amateur Radio Courses:** <https://www.rac.ca/amateur-radio-courses/>

Radio Amateurs of Canada is pleased to continue to promote Amateur Radio Courses - including Basic, Advanced and CW which are being organized by clubs so please send them to us. For example, the Surrey Amateur Radio Communications (SARC) in partnership with the Surrey Emergency Program Amateur Radio (SEPAR), has an online class starting on September 19th.

## SURREY AMATEUR RADIO COMMUNICATIONS

### Your SARC Membership



If you have not already renewed, your membership in SARC expired on May 31st.

You are requested to renew your membership as soon as possible or you will be dropped from the roll.

Note that only those whose membership is in good standing may vote or be eligible to run for a Director's position.

Payment may be made in one of several ways:

1. Use PayPal on the SARC website:  
[www.ve7sar.net](http://www.ve7sar.net)
2. If we meet, bring a cheque or cash to the AGM
3. Mail a cheque to our Treasurer Scott Hawrelak  
13935 80A Avenue, Surrey V3W 6P5

#### Dues are as follows:

- Individual \$31
- Individual (if RAC member) \$26
- Family \$41
- Family (if RAC member) \$36

Thankyou for taking care of this as soon as possible.

~ John Brodie VA7XB  
Membership

### Project update...

Today I tested the "ugly prototype" of the offset attenuator. It worked great. As you see on the videos, you can get right up to the transmitter with no "reflections": <https://drive.google.com/file/1> and <https://drive.google.com/file/2>

I ordered all the parts, most of them arrived but some had a long delivery. I hope that by the end of August all parts will be in.

There are two things you need to remember when you do 2m foxhunting:

1. Turn OFF the squelch
2. Turn down the gain (add attenuation) until you start hearing static as you see in the video. Remember, static is your friend.

Looking forward to doing the club project.

~ Les VA7OM



# SURREY EMERGENCY PROGRAM AMATEUR RADIO



## SEPAR Report

Gord Kirk VA7GK  
SEPAR Coordinator

*One event done...  
one more coming up*



It has been a busier than usual summer for SEPAR members. Normally with the nice weather and vacations, attendance dwindles, but not this year. We have had regular Saturday morning drop in times at the OTC which have been well attended. We have used this time to aid with antenna maintenance and other items that have been identified as requiring some work during field day etc. A couple of larger events which are new to SEPAR are the [Cruise-In](#) event and the [RunSurreyRun!](#) 5 and 10K charity run and walk.

The Cruise-In event was held on a Sunday afternoon and the idea was to encourage people to come and show off either their mobile installation or their grab and go kit. If you didn't have either you were encouraged to come and talk with others about what they did and why, and what was learned during the build. SEPAR sponsored this event to encourage people to have portable communications (including portable power from the car

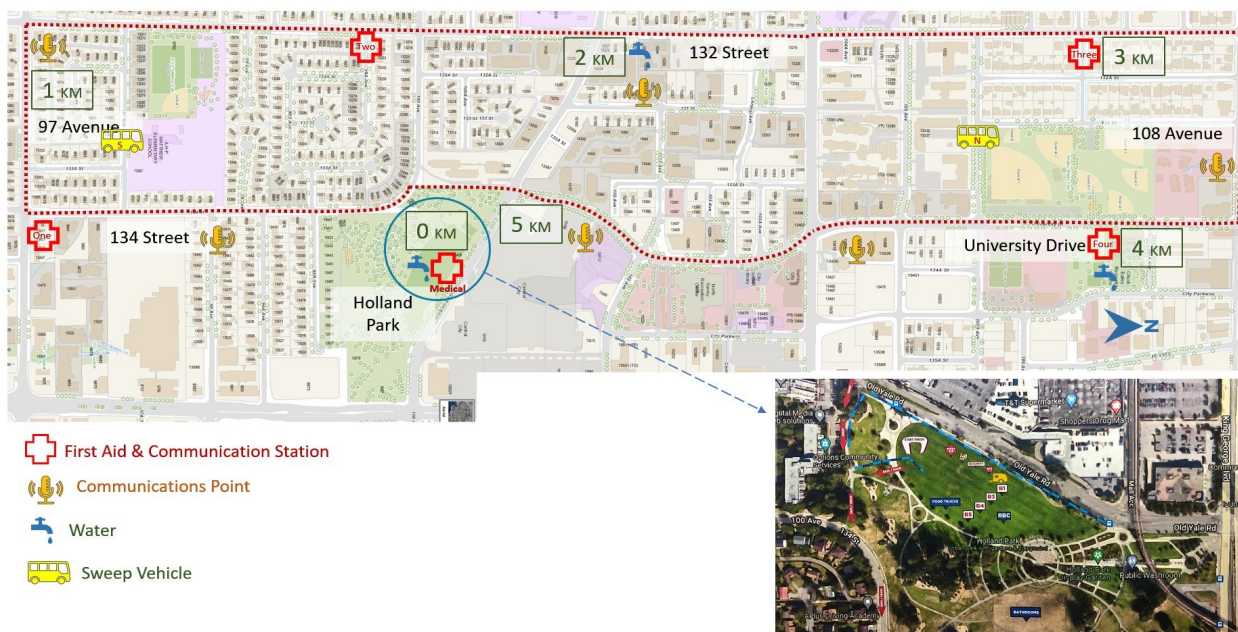
battery) to help people be prepared during disasters when normal methods of communications may not work. The event was free to attend and invitations were sent out to other emergency groups and radio clubs to join us for a fun afternoon event.

We invited the other City Emergency Program partner groups in Surrey to join in, set up, and to encourage preparedness. Our judges for the "best set up" were from the Fire Department and Local RCMP. This allowed participants to explain what they had built and why it was done. There were several stories of how valuable the local radio community and friendships were that came out during the event. It was well attended (see the separate write up starting on page 36 in this issue).





## SURREY EMERGENCY PROGRAM AMATEUR RADIO



Another upcoming event for which planning has been happening is the “RunSurreyRun!” charity event. A 5km or 10km run in which we will be helping with the event communications.

While planning these events is not new to a couple of our members it will be a first in the City. Working with the event organizers, helping them understand what other events have done and learned has certainly helped the organizers in their overall event plan. This event is upcoming on September 11<sup>th</sup> and more information will come after it is complete.

September is traditionally a month where activities kick off after summer break. We anticipate our monthly meetings starting again, and several projects with the repeaters, APRS and Winlink to resume.

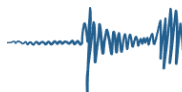
One of the newest projects we will work on is the setting up and testing AREDN (Amateur Radio Emergency Data Network). We hope to set up a proof of concept with point to point communications and look at how we might strategically implement locations throughout the city to help provide connectivity to amateurs wanting to connect to the system.

We look forward to seeing everyone and continuing to build a stronger Emergency Communications program within our city.

~ Gord VA7GK  
SEPAR Coordinator

## October 20th 10:20 am

This is the day millions of people worldwide will practice how to “Drop, Cover and Hold On” during Great ShakeOut Earthquake Drills.



# SURREY EMERGENCY PROGRAM AMATEUR RADIO



Surrey Emergency Program Amateur Radio

## Surrey repeater news:

### VE7RSC 70cm Repeater

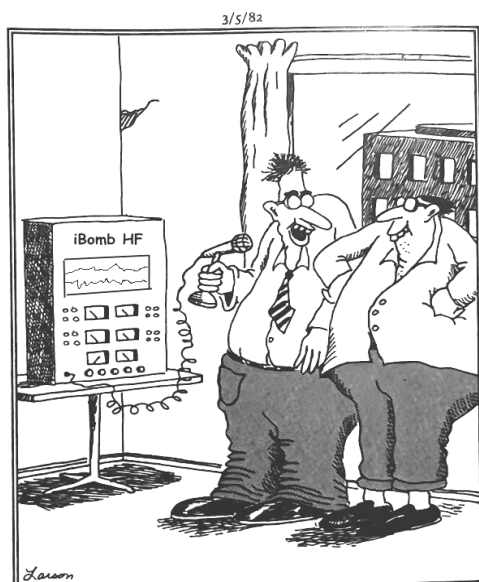
Downlink: 443.77500

Uplink: 448.77500

Offset: +5.000 MHz Uplink Tone: 110.9

Our VE7RSC 70cm repeater, situated near the Surrey—King George SkyTrain Station, is now a Yaesu System Fusion repeater with WiRES-X capability.

Currently it is connected full-time to WiRES-X Room ID 00047



"Oh, wow! I can't believe this thing! ... Does my voice really sound that funny?"

| Name                   | Freq    | Offset   | CTCSS |
|------------------------|---------|----------|-------|
| VE7RSC (Primary)       | 147.360 | +600 KHz | 110.9 |
| VE7RSC (Secondary)     | 443.775 | +5 Mhz   | 110.9 |
| VE7RPT (Regional Rptr) | 146.940 | -600 KHz |       |
| Simplex 1 VHF          | 146.550 |          |       |
| Simplex 2 VHF          | 147.420 |          |       |
| Simplex 3 VHF          | 446.550 |          |       |
| Simplex 4 VHF          | 447.425 |          |       |

### Other Metro Vancouver Simplex Frequencies

|                                       |         |
|---------------------------------------|---------|
| Coquitlam/Abbotsford                  | 146.430 |
| Vancouver/Mission                     | 146.460 |
| Kent/Mission                          | 146.475 |
| New Westminster                       | 146.505 |
| North Shore/Port Coq                  | 146.535 |
| Surrey/Bowen Island                   | 146.550 |
| Vancouver/Delta/<br>Langley/Lions Bay | 146.580 |
| Burnaby/Port Moody                    | 146.595 |
| White Rock/Chilliwack                 | 147.480 |
| Delta                                 | 147.540 |
| EMBC/Hope                             | 147.570 |
| Inter-Municipal Group 1               | 146.565 |
| Inter-Municipal Group 2               | 146.490 |
| Inter-Municipal Group 3               | 146.445 |
| VHF National Calling                  | 146.520 |
| UHF National Calling                  | 446.000 |





## The best hobbies for warding off dementia

The Daily Mail (UK)

It's finally been settled. The best way to protect yourself against dementia is to keep your brain stimulated, a major review suggests.

People who regularly read books, played musical instruments or keep a personal diary have a 23 per cent lower risk of developing the condition. The analysis of dozens of studies involving 2million middle-aged and older people also found physical activity was the next best thing for keeping the brain sharp. Regularly playing sports, doing yoga or dancing was found to have a 17 per cent protective effect. And people with a vibrant social lives appear to have a 7 per cent lower risk of developing dementia than loners.

Researchers said joining a club, volunteering, spending time with friends and families or going to religious events all had a positive effect. Lead author Professor Lin Lu, from Peking University in Beijing, said: 'This meta-analysis suggests that being active has benefits, and there are plenty of activities that are easy to incorporate into daily life that may be beneficial to the brain.'

Their results were published in the journal [Neurology](#).

Around 900,000 people are thought to be living with dementia in the UK, with rates expected to increase with an ageing population. The figure is nearly seven times

higher in the US, with 6.2million blighted by the memory-robbing condition. There is no cure for the disease, meaning doctors can only prescribe drugs that lessen its symptoms.

Doctors recommend a balanced diet and regular exercise, with evidence showing both can protect against dementia. The meta-analysis involved a review of 38 studies from around the world involving 2.1million people who did not have dementia. They were aged 45 to 93 at the beginning of the study. Participants were then monitored for between three and 44 years. Over the course of the study period, 74,700 people developed dementia.

Information about their hobbies were provided through questionnaires or interviews. Leisure activities were defined as those in which people engaged for enjoyment or well-being. They were divided into mental, physical and social activities. Mental activities included reading or writing for pleasure, watching television, listening to the radio, playing games or musical instruments, using a computer and making things.

The researchers said these hobbies help maintain and improve memory, processing speed, thinking and reasoning skills, preventing mental deterioration. But they



said the findings on watching television were still inconclusive. Previous studies have indicated people are more likely to develop the disease if they watch lots of television, because their mind switches off for prolonged periods.

Physical activities in the studies included walking, running, swimming, bicycling, using exercise machines, playing sports, yoga, and dancing. Exercise has been shown to keep the heart healthy and blood circulating normally. Heart problems can increase the risk of dementia by cutting off blood flow to the brain, starving neurons of oxygen and speeding up cell death.

Attending a class, joining a social club, volunteering, visiting with relatives or friends, or attending religious activities were among the most popular social activities in the analysis. Researchers believe spending time with others may protect the brain by increasing social contact and emotional stimulation, while reducing the risk of depression and stress - two risk factors for dementia.

Professor Lu, a neuroscientist at the Chinese university, said: 'Previous studies have shown that leisure activities were associated with various health benefits, such as a lower cancer risk, a reduction of atrial fibrillation, and a person's perception of their own well-being.

'However, there is conflicting evidence of the role of leisure activities in the prevention of dementia. Our research found that leisure activities like making crafts, playing sports or volunteering were linked to a reduced risk of dementia.' He said future studies should include a larger group of people and monitor participants for longer to 'reveal more links between leisure activities and dementia'.

The team noted that the findings relied on volunteers reporting their own activities, so there may be some inaccuracies.

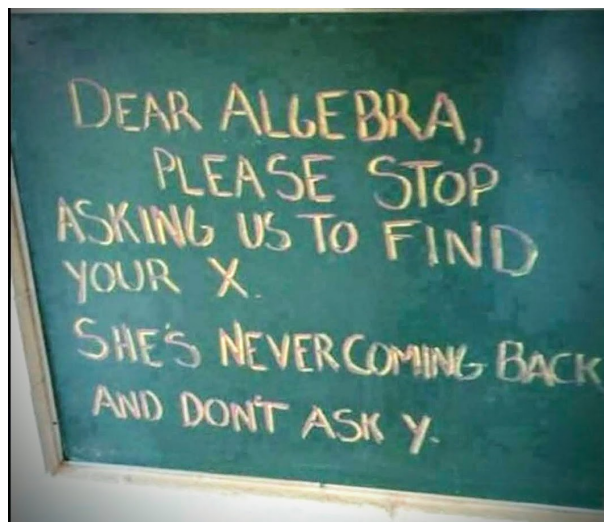
Hmmm... no mention of Amateur Radio.

~

#### Surrey ARC's "The Communicator"

I am very pleased to be on the email list for "The Communicator", which is an outstanding publication generously provided for free through the efforts of a group of volunteers of Surrey Amateur Radio Communications (SARC). The bimonthly publication varies in length and it's March-April 2022 issue had 130 pages of very interesting articles from around the world - some historical, some technical and some general interest. You too can be a recipient of this wonderful publication. You can download it from the SARC website at <http://ve7sar.net/>.

As always, if you have any comments, please contact me at [vy1kx@rac.ca](mailto:vy1kx@rac.ca).



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Stan Williams VA7NF

### SARC MEMBERSHIP, NET & CONTEST MANAGER

John Brodie VA7XB  
[membership at ve7sar.net](mailto:membership@ve7sar.net)

### SARC QSL MANAGER

(pro tem) John Brodie VA7XB

### SARC REPEATER MANAGER

VACANT  
[repeater at ve7sar.net](mailto:repeater@ve7sar.net)

## A look back...

From The Communicator—October 2012



Past Communicators are available at:

<https://ve7sar.blogspot.com/search/label/SARC%20Communicator>



## September—October

Woohoo! We're back for another Amateur Radio year after the summer slow(?) period.

In September Dino VE7XDT will present on 'interesting projects you can build'. Dino is very experienced in this area as shown in his profile in the July-August Communicator issue. His creations look great as well.

Our October presenter is as yet unconfirmed but SARC members and Basic class students will be notified by email well ahead of time.

Enjoy the last few weeks of summer and the start of fall...

**SARC** hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

*We are looking for a SARC Net Manager. Its not a difficult job and, if you have some time to spare, we'd like to hear from you. Basically it involves scheduling someone to do the Tuesday evening weekly net.*

|                                                          | SARC Net<br>20:00 Hrs           |
|----------------------------------------------------------|---------------------------------|
| 1 <sup>st</sup> Tuesday<br>Standby                       | Jean-Luc VA7JLU<br>Reg VA7ZEB   |
| 2 <sup>nd</sup> Tuesday<br>Standby                       | Andrew VA7LGN<br>Sheldon VA7XNL |
| 3 <sup>rd</sup> Tuesday<br>Standby                       | Rob VE7CZV<br>REG VA7ZEB        |
| 4 <sup>th</sup> Tuesday<br>Standby                       | Kapila VE7KGK<br>John VA7XB     |
| 5 <sup>th</sup> Tuesday<br>Standby                       | Reg VA7ZEB<br>John VE7TI        |
| Want a turn at Net Control? Contact the SARC Net Manager |                                 |

## Down The Log...

### SARC Monthly Meetings

2<sup>nd</sup> Wed. (Sept-Jun)  
1900 hrs at the [Surrey Fire Service Training Centre](#),  
14923 - 64 Avenue,  
Surrey, BC. Here is a  
what3words link and map:  
<https://what3words.com/markers.addiction.ozone>

### Weekly SARC Social

Saturday between 0730  
and 0930 hrs at the  
Denny's Restaurant, 6850  
King George Blvd., Surrey  
BC

### Workshops

Saturday between 1000  
and Noon at the OTC  
5756 142 Street, Surrey

### SEPAR Net

Tuesday at 1930 hrs local  
on 147.360 MHz (+)  
Tone=110.9

### SARC Net

Tuesday at 2000 hrs local  
on 147.360 MHz (+)  
Tone=110.9

### VE7RSC Repeaters

2m North: 147.360MHz+  
Tone=110.9Hz  
IRLP node 1736  
Echolink node 496228

1.2m: 223.960 Mhz -1.6  
Tone=110.9Hz

70cm: 443.775MHz+  
Tone= 110.9Hz  
IRLP node 1737

WiRES-X Room ID 00047

2m South: 147.360MHz+  
Tone=103.5Hz Fusion  
capable; No IRLP/EchoLink





### We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for SARC.

The price is \$4 each or three for \$10 and they can be picked up at a meeting or the weekly Koffee Klatch.

*We thank our sponsors for their support of SARC*

*Please support them.*



Successful Guide to the  
Basic Exam  
for the  
Canadian Amateur Radio  
Operator Certificate

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[www.ve3yt.com](http://www.ve3yt.com) for the guide, my intro book and cw course

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